Worklife

U.S. Department of Labor
Employment and Training Administration
December 1976

CETA's New Face In Las Vegas

Worklife

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Employment and Training Administration
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Past, Present, Future

"Those who cannot remember the past are condemned to repeat it," wrote George Santayana. Assuming that is so, then history is worth saving, if only to show us what to do or not to do in the future.

A year has passed since WORKLIFE began its Bicentennial series with *The 'Mechanicks': Work Force of the Revolution.* The 12-part series ends in this issue with *Eli Ginzberg Looks at the Next 100 Years* (page 14). In retrospect, we feel we accomplished what we set out to do.

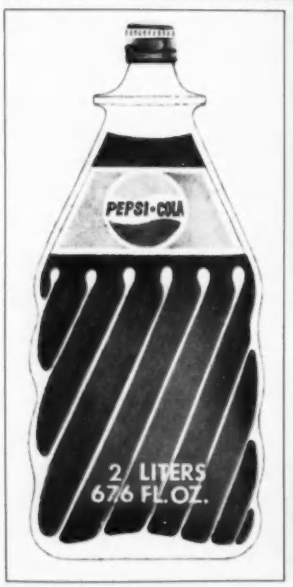
We provided a combination of articles and features that form a chronology of worklife in America from colonial days to the present, and explored the workers' prospects in the third century of our independence. We highlighted the events, characteristics, and policies that marked the development of human resources in the United States. We showed how labor was organized, many of the personalities who molded it, and the pummeling it took while maturing.

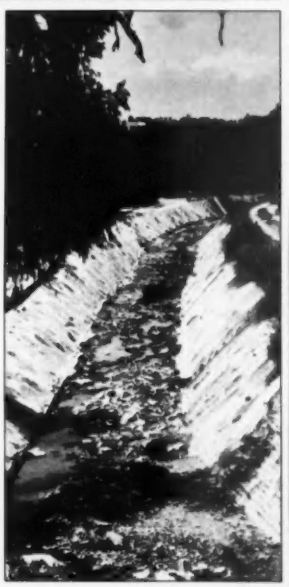
Lest Santayana's warning go unheeded, we looked at the past to be informed about the formative stages of worklife in America. Not to have done so would be to see nothing unusual in the present.

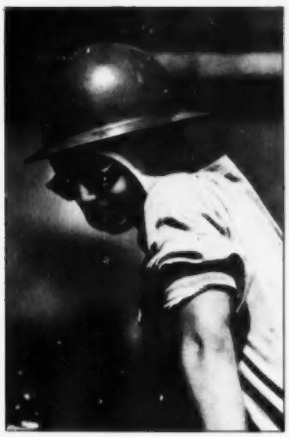
Yet, even remembering the past and making use of its errors, it is impossible to assert absolute knowledge of tomorrow.

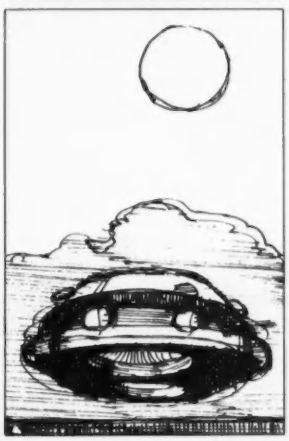
In the brilliant light of futuristic technology—lasers, masers, and landings on Mars—we still search for the right formula for reducing high unemployment. And, although fully informed of the astonishing advances in our society since 1776, we still wonder what jobs will be like in 2001.

Walter Wood









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COVER: A radiation safety technician employed at the Nevada Test Site near Las Vegas received training through an innovative program funded by CETA. Black Star photo

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Las Vegas Bets on a CETA Pair

by Gloria Stevenson

While gamblers try to beat the odds at blackjack, baccarat, or the many other games of chance that flourish in Las Vegas, employment and training officials there are putting money on safer bets.

Since mid-1975, the Comprehensive Employment and Training Act (CETA) prime sponsor for Las Vegas and surrounding Clark County has placed about $207,000 in title I funds on two innovative programs. One offers training for radiological safety technicians and the other prepares enrollees to be directional drillers—sometimes called slant drillers.

One program is already a winner and the second promises to follow suit. The radiological safety technician program has paid off in unusually high wages and placement rates for trainees, while the directional driller program is aiming for an even bigger enrollee jackpot—offshore oil drilling jobs paying up to $200 a day.

Although vastly different from one another, the two programs share several common bonds. Both are unique among CETA efforts, both offer highly sophisticated training, and both were designed to train workers for jobs vital to the Nation's efforts to increase its energy resources.

Moreover, both programs were developed by a private employer that serves the Nevada Test Site, a nuclear testing facility about 60 desert miles from the neon-bright Las Vegas strip. The programs rely heavily on unique training capabilities available at the Test Site, as well as on close cooperation between a private employer and several government agencies.

The radiological safety technician program, which began in March 1975 and ended in November 1975, is the older of the two innovative efforts. Nineteen persons graduated from the program, all received job offers, and starting salaries averaged about $10,500 annually. CETA officials plan to help fund a second such program in 1977.

Gloria Stevenson is assistant editor of WORKLIFE.

The program was designed by the environmental science department of the Reynolds Electrical & Engineering Co., Inc. (REECo). This firm holds a contract to provide support services at the Nevada Test Site, which is owned by the U.S. Energy Research and Development Administration (ERDA) and used for tests of underground nuclear devices and other atomic research.

REECo developed the radiological safety technician program in line with ERDA's efforts to increase the Nation's energy supplies and to train managerial and technical workers who will be needed in energy development during the next few years. Company officials proposed the program after studying projections indicating that between 600 and 1,000 nuclear-powered electrical plants will be set up in the United States between the mid-1970's and the year 2000. About six radiological safety technicians are likely to be needed at each plant.

Radiological safety technicians work in nuclear power plants and at other sites where radioactive materials are used. Their job is to keep employees and facilities at such sites free of radioactive contamination.

The technicians oversee the selection, use, and care of anticontamination clothing and check employees and equipment for radioactivity. They handle, transfer, ship, and store radioactive materials in ways designed to prevent contamination, and they locate accidental sources of contamination. They also respond to industrial accidents and other emergencies in which radiation might contaminate a worksite.

ERDA provided training facilities for the program and subsidized trainees' food and lodging at the Test Site. A $150,000 grant from CETA and additional National Science Foundation funds channeled through ERDA paid for instructors from REECo and Clark County Community College. The CETA funds also provided trainee allowances of $109 a week.

Gerry Silver, a REECo training representative who administered the program, selected 24 trainees from referrals made by the Las Vegas-Clark County consortium. Besides being unemployed or underemployed, applicants were required to have at least a high school education or the equivalent, to be at least 18 years old, and to be U.S. citizens. Silver preferred candidates with at least two units of math and two of science, not including general science.

Because work at the Nevada Test Site is classified, applicants had to get security clearances after being accepted. They were also told in advance that they might have to relocate after training, since few safety technician jobs are available in the Las Vegas area outside the Test Site.

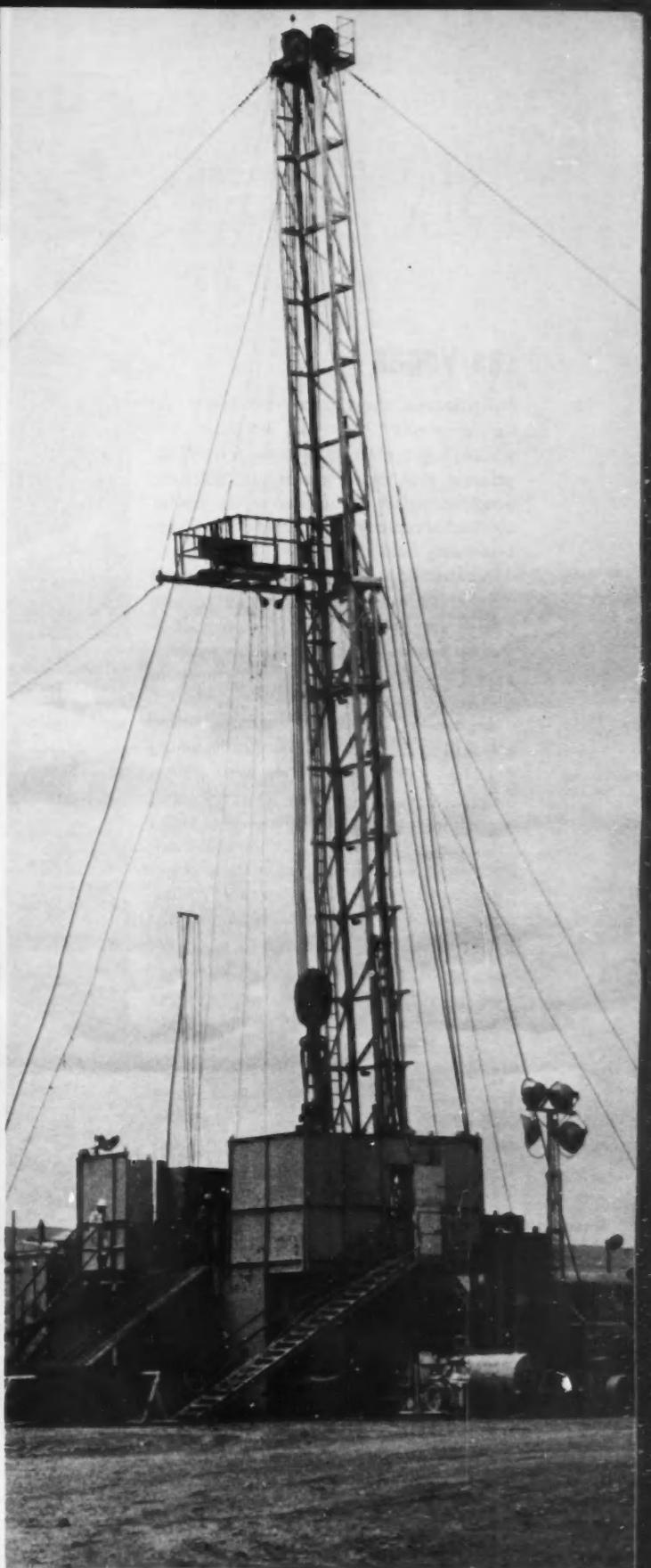
The 6-month program provided the equivalent of 30 semester hours of college-level instruction in all phases of radiological safety through classroom work and extensive training at Test Site facilities. Trainees studied the electronic principles and instruments used to detect and measure radiation, got onsite training in contamination control and radiation monitoring, learned to deal with industrial accidents and other mishaps that could contaminate worksites, and learned to prepare radioactive samples for laboratory analysis. Graduates got 30 hours of credit from Clark County Community College as well as certificates of program completion.

Gerry Silver sought jobs for the trainees by sending brochures describing the program to potential employers. When this approach brought little response, he telephoned likely employers—including almost every nuclear power plant in the country.

The calls paid off. A month after graduation, 14 of the 19 graduates had accepted jobs at starting salaries ranging from $4.44 to $5.10 an hour. All the graduates eventually got job offers, but some turned jobs

Rapho/Photo Researchers photo

Reynolds Electrical & Engineering Co. photo



City of Las Vegas photo

The CETA consortium for Las Vegas and surrounding Clark County has backed two innovative programs designed to pay off in high paying jobs for enrollees trained as radiological safety technicians (left) and directional—or slant—drillers.

Las Vegas

down because they did not want to move to the employers' location, because they wanted higher starting salaries, or for other personal reasons. A few months after the program ended, all but two of the graduates had accepted employment in the radiation safety field.

Meanwhile, REECo had developed another innovative program using facilities at the Nevada Test Site. This program—the only one of its kind in the world—prepares trainees to become highly paid directional—or slant—drillers.

Directional drillers are vital to offshore oil drilling and other operations where holes must be bored into the earth diagonally rather than vertically. The angles and directions for such drilling are determined in advance by complex mathematical calculations. Slant drillers make these calculations and also check the borehole periodically to make sure the drill is following the prescribed course. Monitoring is necessary because changes in the earth's composition, rock faults, and other underground conditions can alter the path of the drill bit.

Slant drillers, who usually work around the clock during drilling operations, check the drill's progress by lowering a camera-equipped device into the hole. The camera takes a picture of a compass attached above the drill bit. The directional driller develops the film to get the compass reading and then checks this reading against the plotted course. If the reading shows that the hole is off target, the driller calculates the degree and direction of adjustments needed to put the drill back on course.

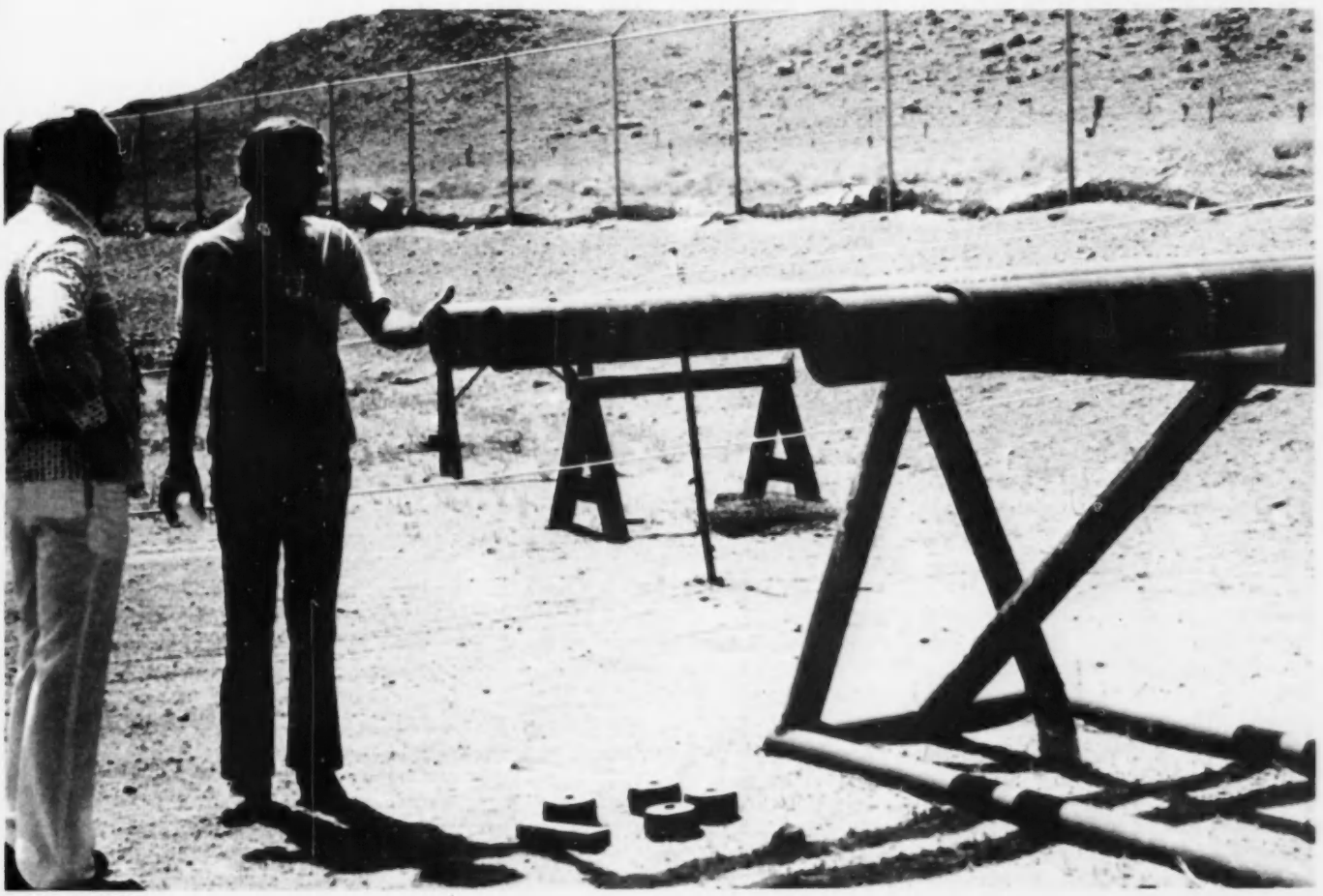
Like the radiological safety technician program, the 6-month directional drilling program is supported by CETA, REECo, and National Science Foundation money granted to ERDA. The CETA contribution is $57,000, which pays for training and stipends of $117 a week.

The training program, which began in May 1976, includes classwork in trigonometry, algebra, and techniques for mak-

The radiological safety technician program, conducted by the Reynolds Electrical & Engineering Co. with Federal support from CETA and other sources, taught trainees to monitor and control radioactivity at nuclear power plants and other worksites. Simulated accidents helped students learn to detect radioactive contamination during industrial emergencies and to treat accident victims.

Reynolds Electrical & Engineering Co. photos

The slant driller program included classroom instruction in the complex mathematical calculations needed in directional drilling. On-site training familiarized students with oil drilling equipment, here examined by CETA planner Matt Matthews (left) and program instructor Bob Thompson.



City of Las Vegas photos

Las Vegas

ing drilling calculations, as well as on-the-job training at the Nevada Test Site. The program is administered by REECo's Gerry Silver, and instruction is provided by two self-employed directional drillers who hold a contract to provide slant drilling services for the Test Site after tests of underground nuclear devices.

A nuclear explosion literally melts the earth at ground zero, where the explosion occurs. As the earth cools, it sinks to form a large crater. Test Site researchers extract soil from deep underneath the crater for analysis, but they cannot set up drilling rigs—which are just like those used in oil drilling—on the unstable surface of the crater. Drilling equipment is therefore used at the side of the crater, and holes are bored beneath ground zero using directional drilling techniques.

The skills used in this operation are identical to those needed in oil or geothermal drilling, the activities most likely to provide jobs for the trainees. Off-shore oil operations are especially likely to need directional drillers, and many opportunities are located in Alaska, the North Sea, Indonesia, and other overseas locations.

Bob Thompson, the directional driller who teaches the classroom component of the program, estimates that there are only 250 to 300 directional drillers in the world, and that most of them are 40 to 60 years old. Thus, he expects that replacement needs in the near future will be relatively high.

Some slant drillers work directly for oil companies or other firms involved in underground exploration, but many work for specialty firms that dispatch slant drillers to a variety of employers on demand. Thompson says salaries vary according to the location of the work and the type of arrangements drillers have with their employers. He estimates that those who move from company to company get about $200 for every day they work. Others may get a base salary of $12,000 to $15,000 a year, plus expenses for travel and food and lodging at worksites. Directional drillers who work overseas, Thompson says, often get $40,000 to $50,000 a year in pay and expenses.

Nine trainees, most of them attracted by the high pay and opportunities to travel, are enrolled in the slant driller training program. Participants include three women and three minority group members. Gerry Silver says this breakdown is significant because all persons now employed as directional drillers are white males.

REECo and program instructors selected the trainees from applicants referred by CETA, as well from unemployed, underemployed, and economically disadvantaged candidates who heard about the program elsewhere. They sought high school graduates 18 and older who had at least a year of college-level algebra and trigonometry but chose some trainees with weaker math backgrounds. Security clearances were required.

Most trainees had never heard of directional drilling before learning about the program. Thomas Artis, 23, recalls that he had just gotten out of the Navy and was applying for a job at REECo when "Gerry asked me if I'd looked into directional drilling, and I said, 'What's that?' "

When Artis learned what the occupation is, it appealed to him. "It sounded interesting," he says. "Travel. Good pay. Interesting work. A lot of responsibility. It sounded like a good thing and since I've been in the program I've really taken a liking to the work."

The pay attracted unemployed Roosevelt Niblett, a 23-year-old who is about to become a father. Niblett was laid off from a room porter's job at a resort hotel 2 years ago, and has worked only part time since then.

"I had no idea what a directional driller was when they sent me to the program," he says. "But the pay appealed to me. I didn't like being a porter; it don't pay and it's a dull job. This pays good and is always challenging."

Gena Cripps, 20, had been enrolled at the University of Nevada at Las Vegas with a double major in physics and engineering, but she decided to leave school and work for several years before continuing her education. She heard about the program from her mother, a radiation monitor at the Nevada Test Site.

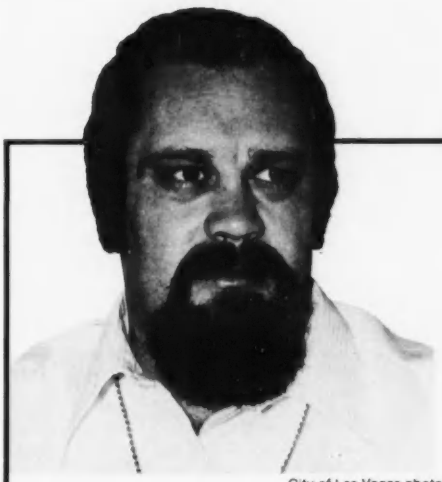
"The travel was the first thing that appealed to me," says Cripps. "Then as I got into it, I found that the jobs would be short-term, so I would be able to complete a job in weeks or months and then move on. I'm looking forward to working in the field—doing hard work, working in bad weather, staying up for 24 hours at a time."

Cripps plans to work about 5 years and then resume college. Realizing that she is preparing for a male-dominated occupation, she hopes that sex discrimination will not limit her chances of employment. "I feel my credentials will bear me out," she says.

As this article was being written, REECo was beginning to plan job placement efforts for the slant driller trainees. Silver expected to repeat the approach that worked for the radiological safety technician program—personal telephone calls to employers.

Silver believes that the program has three big selling points: the caliber of the training offered, the fact that this is the only directional driller training program in existence, and the program's location in Las Vegas. He cites location as an asset because, "Employers are often more willing to make recruiting trips to Las Vegas than to many other cities."

REECo has already received some program inquiries from potential employers, and those involved with the training program hope that placements will follow. If they do, the Las Vegas-Clark County consortium will chalk up another winning bet on program innovation. □



City of Las Vegas photo

Holding On 'Til The Eagle Grins

Huge sums of money change hands quickly—almost casually—in the bustling casinos of Las Vegas, but the city's top employment and training official is, by his own admission, tightfisted with CETA funds.

"I hold on to a dollar 'til the eagle grins," says bearded Al Lipitt, executive director of the Las Vegas-Clark County CETA consortium. His attitude stems from a belief—one not uncommon among prime sponsors—that the area's CETA budget cannot provide enough services for all who need them.

"About 7,000 people have applied for CETA assistance," Lipitt says, "and many more could use it. I would guess there are about 55,000 people in need of manpower services throughout Las Vegas and Clark County. Yet, our title I funds ($3 million) provided services for only 4,000 people in fiscal year 1976, and our public service employment money ($6.9 million) covered only 1,000."

Lipitt says he tries to stretch CETA dollars by cutting administrative costs to the bone. For example, his staff has designed—at rock-bottom cost—a computerized system that holds information about the 7,000 persons registered for CETA assistance. The system stores all information appearing on applicants' registration forms—including age, sex, race, any handicaps, education, and work experience. It also keeps track of all CETA services provided to each client. For example, the computer might show that a client completed an institutional job training program, was referred to two public service jobs without a placement, and is getting adult basic education.

Besides eliminating the need to make time-consuming searches of unwieldly paper files, the computerized system enables the consortium to prepare comprehensive and up-to-date activities reports and to retrieve information needed to make management decisions.

Hardware and software for the system cost only $18,000, according to Lipitt, plus $300 a month to rent a computer terminal through which staff members retrieve information. Costs were kept low because the system was designed by Matt Matthews, a human resources planner on the CETA staff, and by a computer systems analyst borrowed from the Las Vegas city government. The skills bank, which is plugged into the city's computer network, is regularly updated by two CETA public service employees who work under Matthews' direction.

"Instead of buying a canned program that met only 15 or 20 percent of our needs," Lipitt says, "we started by looking at our needs and then designing a system around them."

Besides stretching the administrative budget, Lipitt tries to make program dollars go as far as possible by joining forces with other public agencies. "We try to combine services whenever we can," he says. "For example, we offer CETA basic education through an existing adult education program that was funded by the Department of Health, Education, and Welfare. By putting some CETA money into this program, we can serve a couple of hundred clients without having to start our own program."

Despite such economizing, however, Lipitt advocates the rather expensive innovative programs described in the accompanying article.

"We've got a very limited economy here," he explains, "based primarily on resort and gaming. We're very interested in seeing what we can do to set up programs that expand on that base or move into other fields—programs that will have great long-range benefits for the trainees.

"It's a matter of weighing the pros and cons. Sometimes higher priced programs are harder to swing in the short run, but are more productive in the end." □

News&Notes

The number of blacks and other minority group members participating in apprenticeship programs recognized by the Department of Labor increased significantly between 1970 and 1975, despite a substantial decrease in the total number of registered participants, Secretary of Labor W. J. Usery, Jr., announced. An increase in participation by women also was noted. The number of completions of apprenticeship training remained about the same. State and National Apprenticeship System (SNAPS) computerized data covering the period show overall registered apprentices decreasing from 280,000 to 266,500, with the largest decline in 1975. The decline was attributable to a reduction in the number of new entrants during the 1975 economic downturn. Large declines in New York, Michigan, and Ohio were offset by modest gains in most other States. There were sizable increases in participation by blacks and Spanish-speaking groups.

* * *

The Work Incentive (WIN) program found unsubsidized jobs for 230,900 welfare recipients in fiscal year 1976, about 25 percent more than in the previous year. The total for the period ending June 30 included almost 20,000 in part-time jobs who were unable to find full-time employment. The annual report on WIN, which is jointly sponsored by the Employment and Training Administration of the Department of Labor and the Social and Rehabilitation Service of the Department of Health, Education, and Welfare, also noted that average hourly starting pay was $3.50 and $2.57 respectively for men and women, and that a fifth of WIN registrants were volunteers--persons exempt from mandatory registration who chose to participate anyway. The typical WIN registrant was female (73 percent), had 11 or fewer years of school (60 percent), was 22 through 39 years of age (60 percent), and was white (55 percent).

* * *

The Women's Bureau at the Department of Labor is receiving funds under title III of the Comprehensive Employment and Training Act (CETA) to develop a set of program models based on actual experience gained through CETA-funded projects. The models will be developed with the assistance of the prime sponsors and printed in booklets for use by groups interested in replicating them. The project is designed to identify continuing activities for women throughout the country and to conduct indepth studies and reviews of operations; it will focus on unsuccessful as well as successful experiences and review all material available pertaining to these projects.

* * *

The innovative slant driller program described in this issue of WORKLIFE ended while that article, "Las Vegas Bets on a CETA Pair," was being prepared. A month later, 6 of the 9 program graduates had landed directional drilling jobs paying from $900 to $1,000 a month, plus expenses, to start. Employed graduates included the first woman and the first black ever to be hired as slant drillers. The highest starting pay went to a trainee who got an oil drilling job in Scotland; his starting pay was $1,000 a month, plus $550 a month for living expenses. After a probationary period, the former trainees will earn an average of $11,000 a year, plus $150 for every day they actually work on drilling operations.

MEASURING UP TO GO METRIC

"It is therefore declared that the policy of the United States shall be to coordinate and plan the increasing use of the metric system in the United States . . . ."
—Metric Conversion Act of 1975

Last year, Brown & Sharpe Co., a Rhode Island manufacturer of machine tools and precision instruments, was startled when South African customs officials rejected a shipment of vernier height gages and ordered them returned to the company because they were improperly calibrated.

The trouble, it turned out, was a South African Government program aimed at placing that nation on the metric standard by the end of 1976. To complete the shift with the least amount of confusion, South Africa abandoned the "customary" system of inches, feet, and pounds in favor of centimeters, meters, and kilograms and prohibited the use of products with dual calibration schemes, such as those produced by Brown & Sharpe.

The story had a happy ending for Brown & Sharpe, which easily replaced its first shipment with gages calibrated in metric units only. However, this experience could become commonplace for many other U.S. companies doing business overseas, not only with South Africa but with the rest of the developed world. By 1978, for example, the nine nations of the European Economic Community, which account for about one-fourth of all U.S. export trade, will require that the dimensions and operating characteristics of all products coming into the community be expressed in metric terms.

Late last year, after several years of debate, Congress passed and the President signed the Metric Conversion Act of 1975. The legislation was partly a response to the strong international trend toward the use of the metric system, which is also called "SI," the abbreviation for the French International System of Units (Système International d'Unités), developed at the time of the French Revolution. In the past decade, Canada, Australia, Britain, New Zealand, and South Africa have converted to metric, leaving the United States—along with Brunei, Burma, Liberia, and Yemen—as the most notable holdout among the world's leading industrial nations.

Although the Conversion Act sets no target date for completing the switch, the law establishes a new, broadly based Metric Board, representing virtually all sectors of American economic life, to plan a voluntary conversion program.

On September 29, President Ford named a Metric Board. To head it, he chose Louis Polk of Dayton, Ohio, chairman of the board of the State Fidelity Federal Savings Association and the former chairman of the National Metric Advisory Panel. The President also appointed 16 individuals representing industry, labor, and consumer groups to the board for terms of 6, 4, or 2 years.

Henry T. Simmons, formerly science correspondent for *Newsweek*, is a Washington-based freelance writer.

by Henry T. Simmons

When the National Bureau of Standards of the Department of Commerce announced in 1971 that the conversion to metric was "a decision whose time has come," it said the "real costs and difficulties" the conversion would create could be minimized by planning and coordination.

The Department of Labor (DOL) contributed to a U.S. Metric Study ordered by Congress and carried out by the Bureau of Standards. The DOL expressed support for the legislation and is closely monitoring the process of metric conversion to facilitate the transition. Metric material for field tests at Employment and Training Administration (ETA) Job Corps centers has been issued, and ETA's Bureau of Apprenticeship and Training has circulated questionnaires among its field staff to initiate metric preparation in training projects.

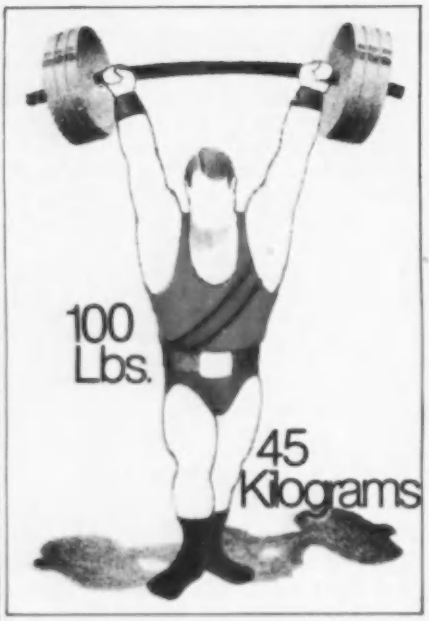
On September 23, the Office of Education announced the award of about $2.1 million in grants and contracts for metric instruction throughout the United States. The grants, authorized under the Education Amendments of 1974, are aimed at both school-age children and adults. Recipients were State and local education agencies, universities, colleges, and public and private nonprofit organizations. Of the 585 applications made for the money, 72 grants were awarded. There is a growing feeling among some businessmen and labor leaders that the metrication of America will be advantageous, that the changeover should be planned and coordinated within the next 5 years. This viewpoint is supported by changing trends in world trade.

It is likely that many sectors of the American economy will continue using customary units of measurement indefinitely, particularly those with little business abroad. Others have stronger reasons for adopting metric. These include the automobile, farm machinery, construction machinery, office equipment, computer, aerospace, and pharmaceutical industries and certain segments of retailing. A total of 37 major U.S. companies in these industries, with aggregate annual sales of more than $130 billion, have either switched or announced plans to switch to metric. Among these companies are General Motors, Ford, and IBM—3 of the 10 largest.

The GM Chevette, for example, includes some metric units, while the engines of the Ford Pinto and Mustang II are built entirely to metric standards. Announcing his company's decision to go metric 2 years ago, Willard F. Rockwell, chairman of Rockwell International, declared: "Ninety percent of the world's population conducting three-quarters of its trade uses the metric system. That 90 percent is buying and selling to each other and they're increasingly cool to the products (that) don't use the same system."

Government policy, and particularly military procurement policy, will have a major impact on the shift of manufacturing industries to metric standards. The Pentagon is pressing hard to increase the standardization of weapons and equipment within the North Atlantic Treaty Organization (NATO).

In addition to its economic advantages, the use of standardized equipment eases problems of logistics and



joint operation. (NATO member countries are almost entirely on the metric standard.) In June 1975, the Defense Department announced that in the future it will use SI in all of its activities consistent with operational, economical, technical, and safety considerations, and that SI will be considered in the procurement of all new supplies and services, particularly in the design of new equipment.

Obviously, the military services aren't going to throw out all of their old aircraft, tanks, and ships designed in customary units and replace them with metric equipment; nor will they automatically require that all new systems be metric. However, this preference will exert a profound effect on workers in the aerospace and other industries which build military equipment.

The impact of metrication has been a matter of concern for American labor leaders, particularly those representing skilled workers—such as carpenters, machinists, and electrical workers—who must supply some or all of their own tools. Probably no group will be affected more strongly than the premier artisans of American manufacturing industry, the tool and die makers, and William H. Ryan of the International Association of Machinists and Aerospace Workers is especially worried about what happens to them. Appearing before the Senate Commerce Committee last year, he estimated the cost of replacing a tool and die maker's tool kit at $3,200, an aircraft mechanic's tool kit at $1,100, and an auto mechanic's at $400. Citing the potentially severe problems involved in tool replacement and metric education programs for workers, he said that he and other labor leaders wanted a provision in the new law allowing for Government reimbursement of workers who may be hard-hit by the conversion.

However, other witnesses, such as William E. Ruxton, technical director of the National Tool, Die & Precision Machining Association, told a House subcommittee last year that the cost of new metric tools to supplement existing tool kits would be less than $200 for the most highly skilled tool and die makers, and $50 or less for machine operators and other semiskilled workers. Ruxton also suggested that for skilled labor as a whole, at least half the cost of going metric has probably been absorbed because most automotive mechanics and garages long ago found it necessary to have metric socket wrenches and other tools to work on foreign cars.

In the end, Congress decided to proceed with metric conversion on the principle, "let the costs lie where they fall." However, although the law does not provide for Federal reimbursement, it directs the new Metric Board to conduct research and surveys on unresolved problems and questions such as the impact of tool costs and training programs.

The introduction of metric standards to aviation operations is a complex and perhaps hazardous problem. After

World War II, the International Civil Aviation Organization, a specialized agency of the United Nations, established two standards for aviation measurements—"ICAO" and "Blue." ICAO, expressed in metric units, was to become the sole system of measurements at some unspecified future time, while Blue, expressed in customary units, was to be used in the interim. It was expected that the use of Blue would gradually be phased out, and that certainly by 1975 ICAO would be used exclusively. Exactly the opposite happened. As a result of U.S. domination of the world market for large civil jet aircraft, the Blue system has bypassed ICAO; by 1970, 86 nations were using Blue and only 38 remained on the metric system.

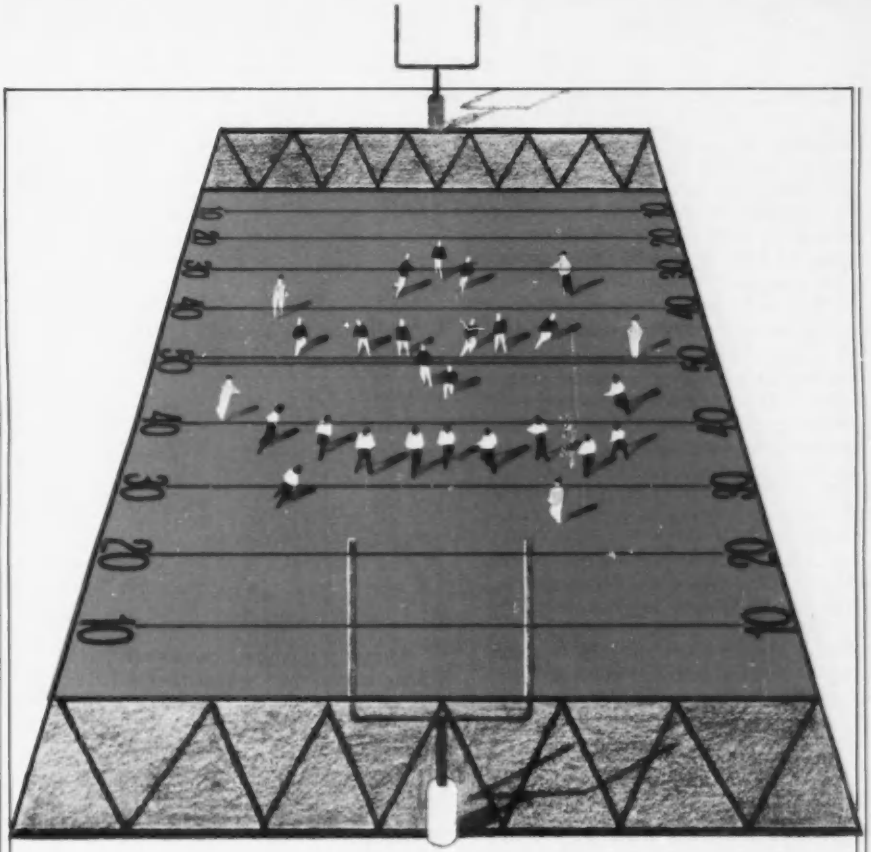
An abrupt shift to ICAO in civil aircraft operations could pose operational and safety problems. For example, a pilot can instantly visualize his landing conditions when advised by the tower: "Ceiling 150 feet; runway visual range, 4,000 feet; wind, 25 knots." But if the tower reports: "Ceiling, 48 meters; RVR, 1,300 meters; wind, 13 meters per second," he will need precious seconds at the busiest point in his flight to translate these values into familiar units.

"Metric meteorology might be taught during the course of a week, or in a home-study course, but a real feel for it would come only after several months or even a year's usage," warns W. B. Cotton, a United Airlines pilot who has studied metrication problems for the Air Line Pilots Association.

This points up a problem which troubles many metrication experts—the difference between "thinking customary" and having to translate back and forth to metric, and "thinking metric" spontaneously.

Most metric experts agree that the "rule of convenience" should govern all decisions on converting to metric. They see two distinct types of conversion. A "soft" conversion consists of writing specifications for existing products, which can be done at any time. A "hard" conversion concerns the introduction of new products, which can be dimensioned throughout in metric, including such basic details as the use of the standard pitch-thread combinations in nuts and bolts and other fasteners. Hard conversions will be phased into the economy as market requirements dictate, while in many parts of the economy metrication will remain limited to soft conversion. Thus, the gage of U.S. railroad tracks may be expressed in metric terms, but will not be physically changed.

While this approach will probably hold total costs of metrication to a minimum in the economy as a whole, it will mean that certain sectors will bear extra burdens—mainly involving the maintenance of dual inventories of metric and customary items—during the changeover. An extreme example is the U.S. fastener industry, which makes 500,000 different standard industrial screws, rivets, and other connectors and 3 million specialized types. A fast conversion would minimize the time that this industry must maintain dual lines of production and dual inventories. On a smaller scale, a farmer with machinery dimensioned in both metric and customary will have to keep separate bins of nuts, bolts, and screws, and will have fewer opportunities of cannibalizing parts from old machinery to use in new equipment.



100 Yards = 92.3 Meters

Generally speaking, the complexities of going metric are directly related to the technical sophistication of the products and services provided by a given industry. The more technical the products and services, the more complex the metric switchover. However, the high level of skills in the automotive, aerospace, and similar industries will facilitate the process: engineers, drafters, tool and die makers, machinists, and other highly skilled workers can readily adapt to the new measurements.

For example, General Motors, the world's largest manufacturer, has found it necessary to assign only two full-time engineers to the company's metrication program, which calls for all of the automotive products to be dimensioned in metric by 1982. Most of the work is carried out in the company's drafting and tool rooms when it can be fitted into the normal flow of activity. Though the program was carefully designed to produce the fastest changeover consistent with minimum cost, the company has been surprised to find that it is working better than expected.

For example, when GM first considered a switch to metric in 1966, it reckoned that each hourly worker might require 16 hours of education. But in 1970, it found that about 10 percent of its employees would need only a maximum of 4 hours of training. GM's bargaining agreements provide that specialized metric tools will be supplied from the company's tool crib on a long-term checkout basis at no expense to the individual worker.

The most difficult problem in converting to the metric system is likely to be the one presenting the fewest technical difficulties and requiring only a minimum of knowledge—that is, public use of products and services newly dimensioned in metric. For the most part, this involves retail transactions in shops, stores, and service stations, but it also includes such services as weather forecasts based on the Celsius thermometer. (Though it sounds bitter cold at 10 degrees Celsius, it's a mild 50 degrees Fahrenheit.)

Every one of the 50 States has stepped up metric education efforts, several specifying that metric units be the primary measurements used in new textbooks. More than a dozen States have tested road signs giving distances in both customary and metric units, and some states are also expressing speed limits in both systems—"50 mph, 80km/h." Pennsylvania and Florida are conducting experiments to test public reaction to the sale of gasoline by the liter. The water department in Kalamazoo, Mich., has begun installing new metric water meters. The U.S. Treasury has set metric standards for wine bottles and is preparing metric specifications for distilled spirit bottles; and the National Weather Service is gearing up to produce metric forecasts.

Important industry initiatives in public education are underway. For example, Seven-Up and Pepsi Cola are marketing liter and half-liter containers at the same price as the old quart and pint, despite the fact that the metric bottles contain more than customary bottles. General Foods Corp. and other major grocery suppliers are now marketing coffee and other products in dual-labeled containers, and Sears Roebuck and other large retailers will soon begin marketing clothing and other products under a dual-labeling system. Incidentially, present U.S. law prohibits metric-only labels and will have to be amended before such labeling will be possible.

Meanwhile, some persons argue that the conversion will not go far enough. For example, there have been efforts to establish metric clocks, but the impact of such a change, it is felt, would be too severe.

Educators like metric because children can learn it and calculate in it much faster.

In this regard, the British estimate that metric terms can save 20 percent of the arithmetic teaching time for children between 7 and 11, or 5 percent of total school instruction time in these years, and that this saving can be applied to other instruction.

It may be, therefore, that when the metric system becomes our language of measurement, our rising generation will take to it with no misgivings and, indeed, with great relief. □

CHARLES LATIMER WOULDN'T GIVE AN INCH...

One of the longest debates in American history was ended last December with the enactment of the Metric Conversion Act of 1975. The law came more than 150 years after President John Quincy Adams first suggested that the United States adopt a universal standard of measurements.

In 1866, Congress passed a law establishing metric as an alternative system, but it was rarely used because manufacturers were committed to English measure.

In recent years, this debate has been a "nuts-and-bolts" discussion of when and how the United States will make the change. But it was not so a century ago when Congress made a determined effort to place the Nation on the metric standard. At that time Britain dominated world trade, and the "Anglo-Saxon" or "customary" system of measurements which America had inherited from England was widely accepted. The effort to shift to metric inevitably aroused strong and passionate opposition.

One of the most effective opponents of metric was Charles Latimer, a Naval Academy graduate and railroad engineer who believed that the customary Anglo-Saxon weights and measures were derived from the dimensions of the Great Pyramid at Giza, Egypt. A Yankee patriot to the bone, Latimer objected to France's gift of the Statue of Liberty to United States in 1887.

"We prefer a statue of liberty measured in good earth-commensurable Anglo-Saxon inches, not in French milli-meters," he declared. And, because the French at that time were also trying to build the Panama Canal, he added for good measure: "We want a Panama Canal laid off in good Yankee feet and earth-commensurable miles, not in deci- and kilo-meters."

Latimer founded the International Standards Institute, which was able to mobilize enough political support to defeat a metrication campaign that the scientific and academic community was pushing in Congress in the 1870's and 1880's.

Today, as we are about to go metric, Latimer's heart would have been broken. We may smile at the old man's crotchets on the subject, knowing they have no place in our practical world. Yet we cannot help but feel a twinge of loss for the passion which men like Latimer could bring to the metric debate in the earlier days of the Republic.

—H.T.S.

Words & Figures

Trade Act Activities

The first 58,000 workers to get Federal adjustment assistance under the provisions of the Trade Act of 1974 received payments totaling $72,800,000 through June 30, 1976. The Department of Labor had certified 149,800 persons eligible to apply; 106,000 applied.

Two-thirds of the benefits went to workers in Ohio, $11,054,047; Michigan, $9,792,249; Missouri, $8,765,717; Pennsylvania, $6,829,768; New York, $6,186,425; and Massachusetts, $5,083,709.

Recipients represented 31 States, but two-thirds of the total came from these six: Missouri, 9,484; Michigan, 8,939; Pennsylvania, 8,316; New York, 5,874; Virginia, 4,520; and Massachusetts, 3,419.

Most of the affected workers came from the auto, shoe, and apparel industries.

Worker Adjustment Assistance April 1975 - June 1976

State	*Amount Paid*	*Beneficiaries*
Maine	$ 736,601	237
New Hampshire	396,068	240
Massachusetts	5,083,709	3,419
Connecticut	681,992	402
New York	6,186,425	5,874
New Jersey	3,827,627	797
Puerto Rico	101,254	116
Pennsylvania	6,829,768	8,316
Virginia	2,915,078	4,520
Maryland	2,413,783	2,746
Delaware	Not available	248
Tennessee	1,656,579	1,590
Kentucky	6,229	7
Georgia	194,451	207
Florida	7,539	6
North Carolina	5,904	4
Mississippi	345,186	305
Alabama	182,443	210
Illinois	2,079,328	1,637
Michigan	9,792,249	8,939
Wisconsin	1,236,595	706
Indiana	2,860,515	1,580
Ohio	11,054,047	2,434
Arkansas	1,912,989	1,566
Louisiana	435,631	507
Missouri	8,765,717	9,484
Nebraska	298,062	367
Utah	79,723	44
Wyoming	89,845	103
Montana	1,369,601	731
California	1,976,012	1,274
Total: 31	$72,800,950	58,616

The Trade Act of 1974, which replaced the Trade Expansion Act of 1962, became effective on April 13, 1975. A major feature of the law provides special income protection for workers who lose their jobs, or whose hours of work and wages are reduced as a result of trade with other countries.

The Trade Act was designed to promote the development and growth of a fair world economic system through stimulating fair and free competition between the United States and foreign nations. While increased trade can benefit the economy as a whole, it can also create special problems for workers in firms particularly vulnerable to competition from imports. To protect affected workers against income loss and help them find new jobs, the Trade Act of 1974 sets up a Worker Adjustment Assistance program of cash benefits and employment services for them. Worker Adjustment Assistance includes weekly trade readjustment allowances (up to a maximum of 78 weeks), as well as training allowances, job search allowances, and relocation allowances.

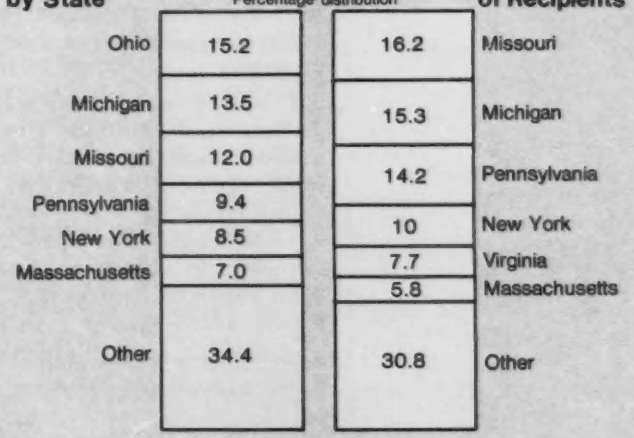
The program is administered by the Employment and Training Administration and the Bureau of International Labor Affairs of the U.S. Department of Labor and is conducted through the State employment security agencies.

Paul Ralli

Paul Ralli is a program analyst, Office of Administration and Management, Employment and Training Administration.

Federal Assistance by State — **Geographical Distribution of Recipients**

Percentage distribution



Eli Ginzberg Looks

by Eli Ginzberg

AMERICAN WORKLIFE

This is the last in a series of special articles and features related to the American Revolution Bicentennial.

Futurologists believe that they can extrapolate recent trends and picture the dominant conditions that will affect the world, work, and workers a quarter, a half, or a full century from now. But I don't have that kind of a crystal ball. Human beings, unlike animals that can only react to their surroundings, have considerable capacity to shape their natural and social environment. Karl Marx notwithstanding, the next stage of historical development is not predetermined. Each stage depends on how men and women react to the opportunities, challenges, and threats they confront. Individuals, groups, and nations respond to their changing environments and in turn alter them by their reactions; each new cycle of interactions leads to a new environment.

Every cycle produces some changes in people's values and behavior, since nations learn from their experiences. However, the fact that people always confront some admixture of the old and the new means that what they have extracted from the past will not enable them to cope adequately with the present. Consequently, environments are always in flux: how people react to any given time, the changes caused by their actions, their reactions to these changes, and the resulting values and goals will guide their behavior in the next round.

The pitfalls involved in attempting to forecast the future of the American worker can be demonstrated by inquiring what a sophisticated analyst could or could not have foreseen at the beginning of this century about the condition of the American worker today. To tip the scales in favor of the forecasters, let us begin by suggesting some of the more important developments that they might have been able to recognize and project.

In 1900, a forecaster might well have foreseen steady gains in the material well-being of the American worker and his family and a higher margin of disposal income for discretionary expenditures. There was every reason to believe that rapid industrialization would have this result.

An astute analyst might have anticipated that the United States would erect barriers to the free flow of immigrants. There was pressure from the nativists, who feared a deterioration of American stock as a result of the heavy inflow of southern and eastern European immigrants, as well as from increasing numbers of American laborers who thought that their struggle would be easier if there was less competition from immigrant workers who were willing to work for subsistence wages.

Again, an alert observer might have perceived that the trade union movement, which had survived many difficulties, would soon experience a large increase in growth and power. Among the factors that seemed to be leading to this increase were the growth of large enterprises; the increasing concentration of workers in urban centers; and growing support for labor by the liberal press, reformers, and politicians.

The growth of the urban population had important implications for the occupational structure, the labor force, and family size. While these linkages were not easy to foresee, a perceptive analyst might have anticipated the growth of service occupations, with the substantial expansion of clerical and sales positions for young women, and the declining number of children per family which would occur as a result of tight urban housing, more widespread knowledge of birth control, and reduced opportunities for children to contribute to family income.

An American forecaster acquainted with developments in Western Europe might have included in his prognostications the likelihood that the United States, primarily through state governments, would follow the example of Germany and

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at the Next 100 Years

England and extend workers' protections against work hazards, accidents, unemployment, illness, and the effects of old age.

Another area in which an analyst was in a good position to outguess developments was with respect to the hours of work. By 1900, growing numbers of workers, particularly civil servants and craftworkers, had substantially succeeded in reducing their average hours of work per week from 60 or more to 48. Since further reductions in work hours depended on increased gains in real per capita income, such changes must have seemed almost inevitable. Only the timing, size, and nature of the decrease was uncertain.

Thus a turn-of-the-century analyst extrapolating from existing trends might well have foreseen the likely changes in American worklife that would result from a better standard of living, the growth of trade unionism, the shift to urban life, possible Government intervention in the economy to mitigate the loss of jobs and income during downturns and the trend toward reduced work hours. One might say that if so much could have been revealed, futurology surely warrants respect. But before reaching such a conclusion, let us consider how the same method of extrapolation might have misled even the most accomplished social analyst of that day concerning important developments.

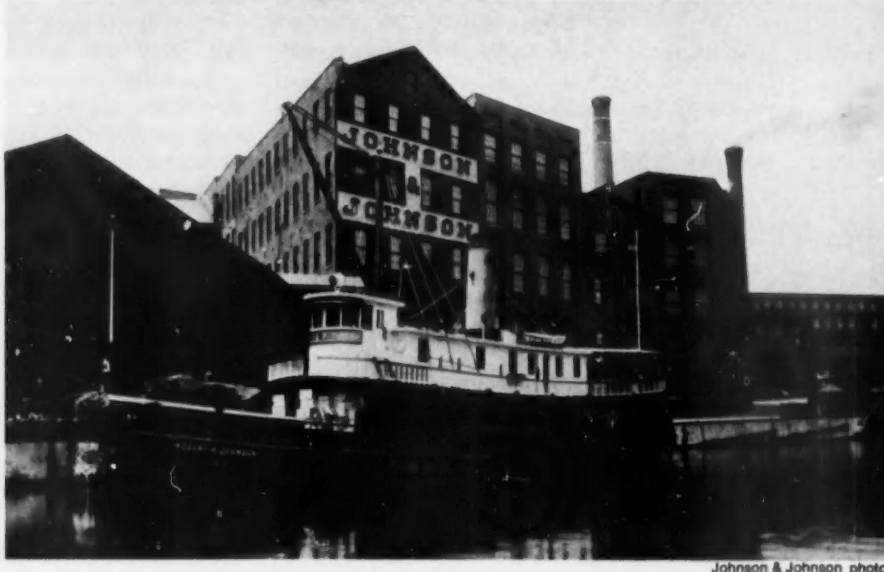
Wars are always hard to foresee; in 1910, Western Europe and the United States had avoided any major conflict (the Civil War excepted) for the better part of a century. Nevertheless, the United States was actively engaged in combat in the second, fourth, fifth, and sixth decades of this century. The impact of war spans the years when a nation is preparing its offensive or defensive posture and when it is absorbing the war's consequences. To illustrate: between 1940 and 1973, except for a period of less than 2 years, the Selective Service System drafted young men for military service. Compulsory military service affected the goals, skills, career prospects, and, of course, the health and lives of tens of millions of persons.

It would also have defied the powers of even the most astute observer to chart the stages of political reform—the collapse of the left; the New Deal; and the rapid expansion of government to a point where in 1976 it accounts for about 40 percent of all expenditures, close to one-third of all jobs (direct and indirect), and one quarter of the Gross National Product (GNP). In addition, no one could have predicted the emergence of communism in the USSR and later in China, or the American reaction to it.

The turn-of-the-century observer could not have forecast the outlook for blacks, that large minority submerged on Southeastern farms who were no longer slaves but surely not free. For the first 40 years of the century, the position of these people scarcely changed, but in the 35 years since World War II, they have experienced a greater change in every respect—residence, education, work, income, political influence, social acceptance—than in their previous 339 years on the North American continent. Many blacks remain on the periphery of American society—poor, unemployed, second-class citizens; but the fact is that segregation has been largely ended and it will never be revived. President Taft, talking to a group of black college students about the time I was born, told them that they could not hope to rise above the status of peasant farmers and advised them to consider emigrating to Africa. Today, the leaders of both parties talk about the limits of Federal action to integrate schools and neighborhoods!

If changes in the circumstances of blacks, however belated, were hard to foresee, even less predictable were the changes in the roles of women. That they would win the vote, have smaller families, and participate more actively in the economic and social life of the community might have been anticipated by perceptive observers. But no

Lewis W. Hine photo from George Eastman Ho



Johnson & Johnson photo

Ginzberg

observer could have imagined that more and more married women would spend most of their lives in the work force, that they would account for almost half of all college students, that 1 out of every 4 or 5 physicians would be a woman, or that women would be members of the armed services. Other related developments that would also have been impossible to foresee were the rise in the number of single-parent households headed by women; the steep increase in divorces; the decision of young middle-income families to have no children; and the improvement in female longevity to a point where, today, 1 in every 4 adult women will live to the age of 85 or beyond.

Changes in the nature of work would also have been impossible for the turn-of-the-century forecaster to extrapolate. In 1900, work consisted primarily of hard physical labor, although Americans had early made use of machines to conserve their strength and to increase their output. No one could have foreseen that by the time the century had reached its three-quarter mark, only 1 out of every 3 workers would be directly engaged in a goods-producing industry (and not necessarily directly involved in producing goods) and that the service sector would be dominated by office work, consisting mainly of written and oral communications.

Wars and their consequences, political transformation, the changing roles of blacks and women, and the alterations of the work environment have been the primary changes that have transformed the lives and labor of the American worker in the 20th century. None of these major transformations was visible in 1900, and no one could have foreseen how the American people would respond to the opportunities and constraints that they offered. Futurology, then, is a dubious venture. Nevertheless, with these caveats in place, let us sketch, not what may happen in the years ahead, but the options that American society may provide.

In shifting the focus from past to future, it is important to establish the boundaries of this inquiry. We will focus not on the years immediately ahead, but on the longer run options that may face the American people as they shape and reshape their lives and work in more fundamental ways.

The Club of Rome's two reports on the implications of economic growth, *The Limits to Growth* and *Mankind at the Turning Point*, have caused considerable controversy. It seems to me that the burden of proof remains on those who foresee an early end to the growth of output in the developed world. I postulate that, in the absence of a nuclear holocaust, economic growth will continue for the next several decades—and for the purposes of this estimation it makes little difference whether the rate of growth is rapid or decelerates.

The critical question is, to what purposes will we use the additional output? We can distinguish five alternatives, although they are not independent of each other: employment, egalitarianism, or improving the quality of environment, the quality of work, and the quality of life.

Everything, including the kitchen sink, has changed so much in the past 100 years that even a futurologist might find it difficult to forecast what a homelife picture will look like a century from now.

National Association of Home Builders

Contrasts in workplaces "then" and "now" are striking enough to stimulate visions of future industrial sites so attractive that enthusiastic environmentalists' goals would be reached.

Ortho Pharmaceutical Co. photo

The rapid tap-tap of manual typewriters, already muted by present day electronically operated office machines, will be but a memory when futuristic business systems go automatically and quietly about designated tasks.

Women's Bureau photos

IBM photo

Lewis W. Hine photo from George Eastman House

Ginzberg

It may seem paradoxical that at a time when the developed nations are enjoying the highest material standard of living achieved in human history, a standard that gives promise of continuing to rise, there is growing concern about the capacity of these nations to provide employment opportunities for all who are able and willing to work. But the paradox dissolves when it is realized that the concern has less to do with increasing the total output of goods and services than with the recognition that individuals who are unable to participate fully in the major structured activity of their society are condemned to a half-life. They lack the opportunity to be self-supporting, to associate with others in constructive activities, and to learn new skills and use them to obtain better jobs with more security and rewards. Much of the argument between conservatives and liberals about unemployment figures, especially as they relate to youth and women, misses this point that jobs are important far beyond their income dimension.

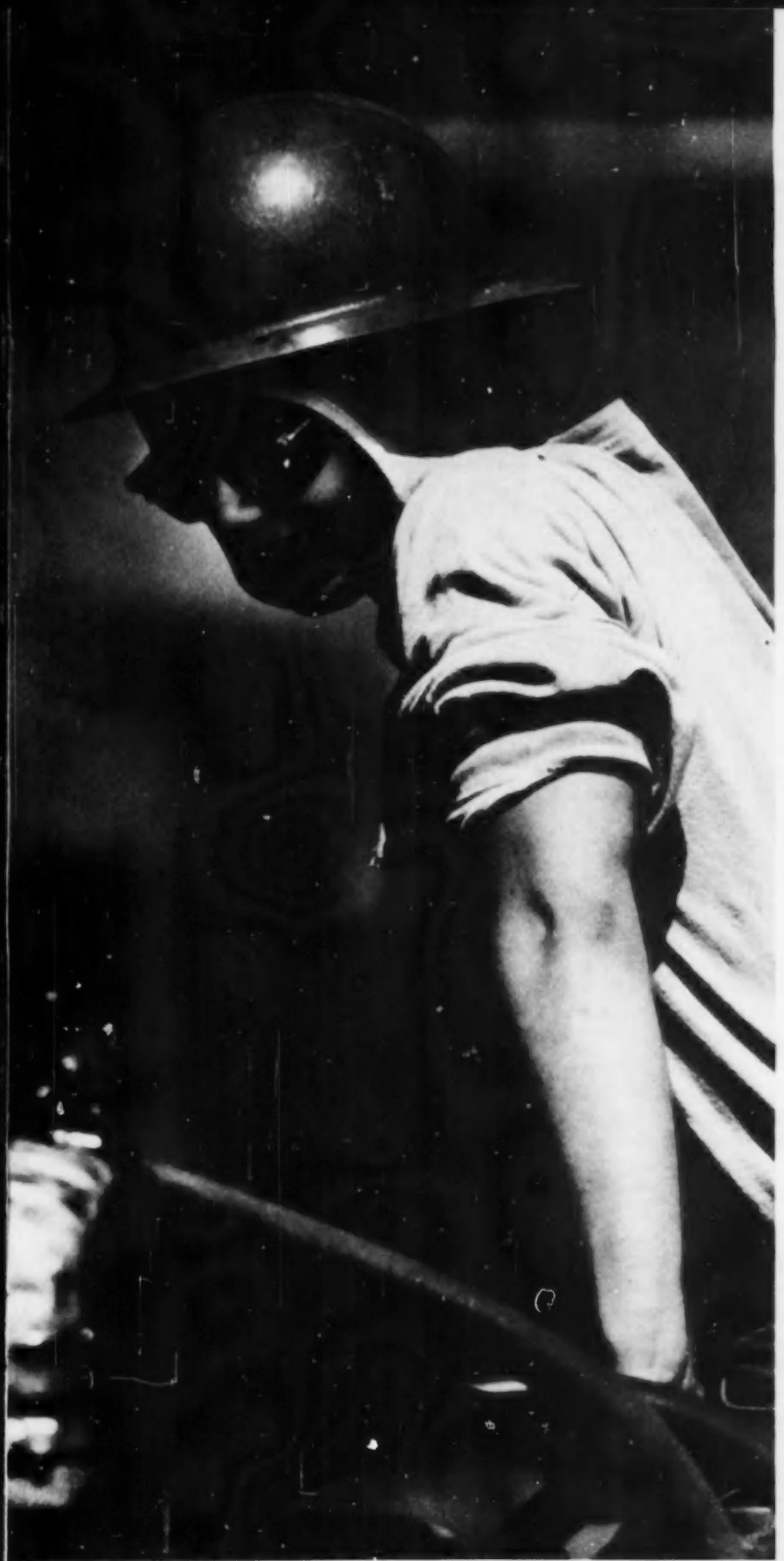
It is too early to predict what success developed nations will have in assuring employment for all who want to work, including many who will be unable to meet prevailing minimum output standards. What can be foreseen at this early stage, however, is that even if the effort is exceptionally successful, it will not be long before the societal objective moves from "a job for everybody" to "an opportunity for a good job for everybody." And that goal will turn out to be unrealizable for reasons that we will address shortly. But before discussing the quality of work, we must briefly consider two other competing objectives: the dynamics of egalitarianism and of environmentalism.

We noted earlier that one of the unforeseen developments of this century has been the concatenation of forces operating in the private and public sectors, through trade unionism and Government primarily, to bring about a more egalitarian approach to opportunity, work, and income. About 40 percent of today's students who graduate from high school continue their education or training so that they can compete for the better jobs. Colleges, professional schools, and large employers have increasingly removed arbitrary barriers to selection. While income differentials remain large, the gap among groups in after-tax income and access to public services has been substantially narrowed over the years.

Reductions in the average hours of work and protection against work hazards were developments an astute analyst might have foreseen.

One of the important decisions the United States will face in the years ahead concerns the amount of money and effort it is willing to expend on achieving other egalitarian goals. Another question is whether these efforts should be directed primarily to broadening access to opportunity or to equalizing rewards. In determining the rate at which egalitarian goals should be pursued, the American people will have to consider the impact of such an effort on worker productivity and on the scale and scope of Government—to mention only the more important related decisions.

A third intersecting goal concerns the quality of the environment. The American people have become conscious during the past years of the long-term and often irreversible deterioration of the environment that is associated with economic growth. They must decide how much current output they are willing to forego to prevent the quality of the environment from being seriously impaired for the next generation.



The entry of women into jobs traditionally reserved for men only was unpredictable.
American Iron and Steel Institute photo

There is considerable evidence that employment and egalitarian goals conflict to some extent with environmental protection. For instance, views of the public utility industries pressing to build additional nuclear power plants are in sharp contrast to those of environmentalists who oppose the plants. Strongly conflicting views were also expressed by upper income whites, who sought to avoid the pollution of the South Carolina beaches by preventing the construction of a chemical plant, and low income blacks, who supported the plant because of the additional jobs and income it would provide.

The strike at GM's Lordstown Vega plant reminded the American public how irrational it is to disregard or downgrade the importance of workers' satisfaction with their jobs, since they spend close to half their waking hours working. The distinguished Columbia University economist, John Maurice Clark, pointed out a quarter of a century ago in *Alternative to Serfdom* that the most important product of industry is what it does to the workers.

The challenge of improving the quality of working life is surely on the Nation's agenda and is likely to remain there. If people are no longer forced to work in order to eat but do so to earn money to spend on less compelling desires, they will sooner or later concern themselves with the satisfactions that they can achieve through working.

During the past few years we have seen the emergence of a new international "movement" that goes under the acronym QWL—quality of working life—with professors and consultants in the vanguard associated with some forward-looking employers and trade union leaders. If we accept the assumption that the squeaky wheel gets attention, then we must look with favor on this new interest and concern with improving the work environment so that those who spend 8 hours a day at a job are not bored to exhaustion, relaxing only by betting on sports, exchanging jokes, or reporting on their sexual experiences or dreams.

Employers and labor are working together to alter the circumstances in which work is conducted so that routine is substantially reduced; the margin for initiative is broadened: the pace is set by the individual or the work group, not by the machine; and the quality of work is transformed from bearable to interesting. However, caution is indicated. Small changes can be introduced which workers will welcome, but it hard to see how the work environment, with its limited number of good jobs, can be altered to provide most workers with both interest and excitement, if not status and power. Two hundred years ago, Adam Smith pointed out that the principal reward for a routine job is the earnings it provides.

This brings us to the fifth and last alternative for the use of the growing surplus of income in developed economies. We can try to keep the system operating as it has been, and turn out an even larger number of goods, from second cars to second houses, at least until people decide that they are not getting enough satisfaction from their ever larger number of possessions.

To what does this point? In the years following the Bicentennial, the decisions that American society will make about the distribution of its disposable private and public income among greater expenditures for *altruism* (expanding employment, reducing inequalities, and protecting the environment), improving the *quality of working life*, or enabling consumers to enjoy a higher level of *material well being* are the terms of the equation that will determine the work and life of the American worker. And how the worker will respond to the consequences of society's earlier decisions cannot be foreseen.

But I will not shirk my task of pointing the way in which I believe American society will evolve, and I will even be so bold as to specify my own preferences.

First, I foresee no substantial increase in altruism, an early disillusionment with the potentialities of improving the quality of working life, and a continuing emphasis on raising the standard of material comfort. If these are in fact the choices, then it follows that there will continue to be a substantial stratification among American workers, with the more skilled and protected earning four times the minimum, twice the average, wage. We will continue efforts to remove people from the clutches of poverty, only to discover to our frustration—and theirs—that there will always be some at the end of the queue, living in conditions that are degrading to them and dysfunctional to society.

With respect to improving the quality of working life, it is likely that the insight of Adam Smith will be confirmed. There is not much that can be done to make the average job interesting, and less to make it exciting. We are more likely to resort to the tried and tested approach of reducing the conventional number of hours worked per day, per week, per year, per lifetime. To the extent that society adopts this option—and some workers already enjoy it—the stage is set for a new trade-off for American workers among material possessions, work, and other uses for their time and money.

While the foregoing may represent a reasonable estimate of things to come, it is essential to recall the earlier warning that all estimates are problematic because of the uncertainty that attaches to how people will respond to the new. We can recognize the interrelations among the growing expectations of educated women, changes in marriage and birth rates and family life, the renaissance of cities as residential centers, and the further shift of the economy from producing goods to producing services. But there is no way to outguess how these several factors, and others not known, will interact and what their consequences will be for altering the work and life of the American people.

We have established that no one can provide an authoritative sketch of the future. But I promised to indicate the directions which would enlarge the welfare of the American worker. In *The Human Economy* (McGraw-Hill, 1976), I stressed the broadening of options as *the* criterion of social progress. In the present context, this criterion suggests that the American people must continue to deploy a considerable part of their additional surplus to altruistic purposes, from helping the disadvantaged to protecting the environment. Only if we do so, will we be able to become fully engaged, to find satisfactions that transcend our own personal confines. As Tibor Scitovsky sets forth in his important book on *The Joyless Economy* (Oxford, 1976), a life of comfort without the stimulus of novelty and excitement is only half a life.

With respect to work, I see several forms of progress: shorter work periods; expanded opportunities for workers who seek to change their jobs; an increase in avocational activities; and finally, serious efforts by employers to eliminate practices that restrict and diminish the working person without adding significantly to the efficiency of production.

But the real test of whether a society is using its surplus wisely or squandering it must be in the expansion of options open to individuals to lead interesting and exciting lives. The output of ever larger quantities of mass produced goods can contribute to their comfort, and competition among people to see who can command the most of them can add an element of spice and excitement. A few winners and many losers is, however, a poor system of social organization. The real challenge is to assure that all members of the society have the opportunity to pursue whatever combination of excitement and comfort, from whatever activities, they can derive satisfaction.

Work, money, power, family, sport, security, friendships, religion, the arts, education, travel—these individually, or in different combinations, can be the fulcrum of peoples' lives. The challenge is to provide each person maximum opportunity to pursue his or her interests as long as these interests do not interfere with those of others. The greater the range of options, the greater is the likelihood that each person will be able to come closer to a fuller life, without diminishing the opportunities for others to do the same. This is a worthy goal for the United States as it enters upon its third century. □

Work in 2001

by William Abbott

On the eve of America's third century, a futurist writer makes imaginative predictions of what worklife will be like in the year 2001.

For American workers, the 21st century promises to be an age of mass pioneering of outer space, the ocean depths, and human inner space.

Even now, experiments which will change the nature of jobs are taking place in interplanetary space, under the sea, inside the psyche, in nuclear and biological laboratories, and in the workplace.

We have already developed what John T. Dunlop, former Secretary of Labor, now the Lamont Professor in the Graduate School of Business Administration at Harvard University, calls the "industry of discovery"—science giving us the knowledge, research pointing to ways of using it, and technology putting science and research to work.

By the year 2001, most industrial workers will be employed in autonomous teams, making their own production decisions. They will be returning to school at least three times in their lives and joining unions which will bargain for their education and the quality of their worklife and provide them with extensive counseling services, including "community stewards" to handle neighborhood grievances. Work will be organized horizontally, with employees and managers making production decisions jointly. Call it "Unimanage."

American farmworkers will apply new technologies. Some will work (and perhaps live) as aquaculturists, developing rich food-producing life beneath the sea in fish ranches, breeding strains of fish, and herding them with electronic equipment. Others will increase the productivity of their land by turning to microbiology—using bacteria, fungi, yeast—to fashion new forms of food.

Space colonization will offer a new frontier. Princeton physics professor Gerard K. O'Neill says that within 25 years we can "establish a permanent beachhead in space near L 5, a location on the lunar orbit equidistant from the Earth and Moon . . . (which could) support a work force of 10,000 people in comfort, even in some luxury, within a large enclosed volume having a climate where flowers, trees, birds, and animals could flourish and in which earth-normal gravity could be provided by slow rotation."

The 2001 space industry will need not only spaceship builders but highly skilled maintenance and repair people to manipulate the sophisticated outer space equivalents of today's earth-bound gasoline service stations or automobile tow trucks required to operate life support systems and communications stations in the sky.

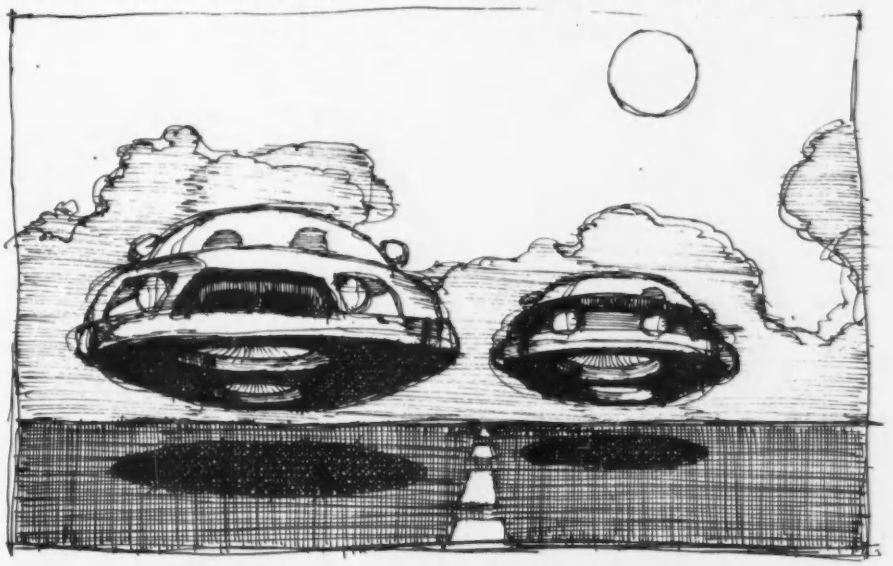
On earth, the air car will float over graded airways. Although this may be a blow to the rubber tire industry, factories will be booming with the production of conveyor belts to move pedestrians and freight in cities freed of hazardous air pollution and auto traffic by bans on the use of combustion engines. Mass transit will have become an intricate network of subways and high speed surface trains.

Employment in the building trades will soar with the institution of regional governments formed simply to get things done efficiently and economically in urban rehabilitation. Faced with the task of rebuilding entire urbanized areas such as "BOSWASH"—the Boston to Washington corridor—regional governments will provide over 60 percent of all construction work.

To counterbalance regional government efforts, professionals at the community level will plan projects for jobs, housing, the arts, park and recreation facilities, and neighborhood redesign. The professionals will provide the techniques, while community residents make the decisions. The most progressive decisionmakers will be senior citizens retrained to study problems in depth and develop solutions. The seniors will be the social innovators because educational renewal and their experience will make them leaders in reordering priorities and mobilizing society to meet its needs.

Solar energy will replace depleting fossil fuels and other energy sources too costly for the public to bear. Solar engineers, technicians, and architects will be in demand for the heating, construction, and other industries.

Automated business systems will correct their own errors by talking to themselves, make judgments from programed instructions, and remember old data at appropriate times. Computers will replace some workers, but the number of job dis-



Buck Rogers and Flash Gordon would be at ease in these automobiles without wheels. They'd have no worries about "flats" while tooling over graded airways.

William Abbott is writer-editor of the *Careers Tomorrow* newsletter of the World Future Society. He is also director of the Service Center for Community College-Labor Union Cooperation of the American Association of Community and Junior Colleges.

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placements will be offset by the need for more analysts and programers.

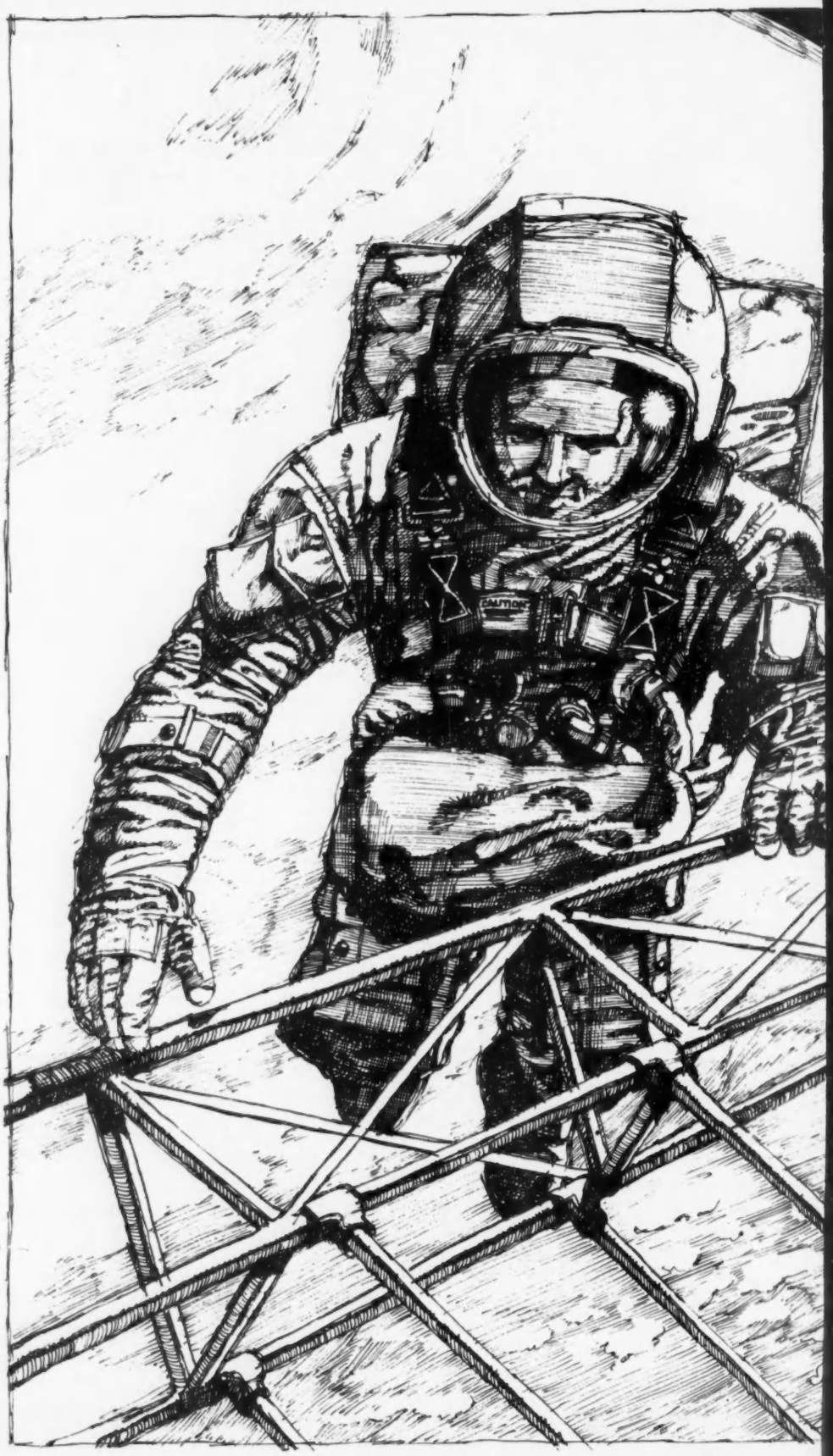
On top of a continuing technological revolution in the 1970's, the decade has been marked by several concurrent revolutions: the Equality Revolution, the Knowledge Revolution, the Value Revolution, and the Consciousness Revolution.

As a result of the Equality Revolution, the equal employment opportunity and affirmative action goals of the 20th century will be accomplished facts. Human justice will be a partner with economics in determining jobs.

Corporations will spend billions of dollars a year keeping employees abreast of new knowledge. "Knowledge workers" will be highly sought after. Describing the Knowledge Revolution, Robert Hillard, educational broadcasting specialist for the Federal Communications Commission, said recently:

"At the rate at which knowledge is growing, by the time the child born today graduates from college, the amount of knowledge in the world will be four times as great. By the time that same child is 50 years old, it [the amount of knowledge] will be 32 times as great, and 97 percent of everything known in the world will have been learned since the time the child was born."

The Value Revolution will determine the nature of many of tomorrow's jobs. Material values such as styles and status will give way to human values. Today an ever increasing number of people are asking themselves: "Who am I?" "How can I best develop my unique potentialities?" and "How can I obtain that inner peace of mind called happiness?" In the future, individuals will shop around for services that provide answers to these questions. They will



Perhaps in the next 100 years, American construction workers—equipped with life-supporting gear and supplied by space shuttle from earth—will be building orbital public service platforms in the sky. Trusses would flow like ribbons from cassettes in an orbiting, automatic fabrication module.

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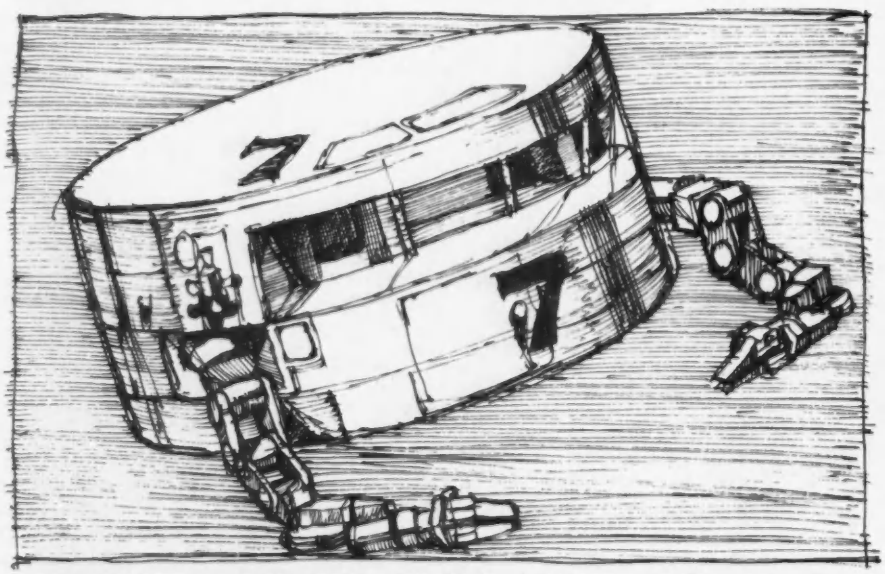
pick and choose as if the Nation's service-dominated economy was an immense supermarket.

The Consciousness Revolution of today indicates what the consumer of tomorrow will be demanding. "Psychenauts," a term coined by behavioral scientist Jean Houston, are currently probing inner space to help people find levels of consciousness to better communicate with themselves and with others. Already, there are 8,000 methods advocated as the right road to pursue happiness. Werner Erhard packaged his "est." He has already sold it to 83,000 individuals at $250 each for a 60-hour "experience" in discovering alternative realms of consciousness within oneself. Thus, awareness, a big business now, will be bigger.

The Consciousness Revolution will produce significant job spinoffs in what futurist Alvin Toffler calls "experimental industries" including simulated environments. "Thus," he says, "computer experts, roboteers, designers, historians, and museum specialists will join to create experiential enclaves that reproduce, as skillfully as sophisticated technology will permit, the splendor of ancient Rome, the pomp of Queen Elizabeth's court, the 'sexoticism' of an 18th century Japanese geisha house, and the like."

Meanwhile, Americans are trying to improve their immediate potentialities. For example, 17,000,000 enrolled in adult education studies in 1975. The conservative Success Motivation Institute of Waco, Tex., became a multinational operation by providing employers (as well as individuals) training courses which coupled the latest techniques in motivational psychology with early 20th century homilies on personal success. Other "self-reliance" projects are conducted by liberal nondoctrinaire groups with the same goal in mind. Thus, self-improvement movements cut across political lines.

The self-awareness and self-improvement movements will be a major industry in the year 2001 employing professional and paraprofessional counselors, program and project administrators, mentors, tutors, illuminators, facilitators, trainers, and social actionists for geographical, mutual interest, ethnic, public health, ecological, and other communities.



All of the future space workers' tools would not be hand-held instruments. Some might be orbital machines of which the workers would be parts, operating long arms from within the tool, as shown in this artist's conception.

While typists and file clerks will dwindle as speakwriters (typewriters that will take dictation), and robotized filing machines take over routine office work, white-collar workers will labor more creatively by condensing torrents of new knowledge into frequent newsletters for all manner of national organizations and many of their local affiliates. "Capsi-Knol" (capsuled knowledge) will employ several hundred thousand readers, interpreters, and writers.

With the accent on a labor intensive economy of service workers, together with citizen participatory planning, unemployment will no longer be a problem and work will be measured by workers in qualitative terms. The concern will be with what kind of employment and whether it will lead to job satisfaction.

However, society will not be utopian. There will be sprouts of upheaval against the majority, against group-think and group-act, against committees, against bureaucracies, and against certification of the new professions.

The year 2001 will also usher in a new age of teaching. Community colleges and those universities which changed direction to survive the crisis in education of the 1970's will be primarily geared to recurrent education where students drop in and out to study what they feel they need at a given time in their lives. The present pattern of preschool, elementary, high school and community colleges and universities will remain because a good general education will become increasingly necessary to cope in a knowledge-structured, constantly changing world of work. Students will, however, serve job internships—a variety of them for each individual—to enlarge job options.

Future educators will be skilled in adult education techniques. They will be combination instructors-counselors-administrators on campuses, in satellite college neighborhood drop-in centers, in churches, union halls, factories, store fronts, and in homes. Home education will be communicated through personal visits or electronic media.

These predictions are all likely possibilities, but could be negated at once by a catastrophe such as nuclear war—a departure into darkness. □

The American Worker IS America

The American Worker IS America

The contribution to our Nation's progress by all who work is poignantly expressed by teenager Nancy Jenson, of Idaho Falls, Idaho, in her essay which won the Department of Labor's Paul Revere Silver Bowl Award at the 1976 Vocational Industrial Clubs of America Leadership Conference and U.S. Skill Olympics. Her words provide a fitting conclusion to WORKLIFE's Bicentennial series:

Who am I?
I am the embodiment of the American worker.
I have lived for over 200 years as the heart and soul of America.
I have no specific age, sex, creed, or nationality.
My love for freedom, liberty, equality, and life is unending.
I came with the Pilgrims seeking freedom.
I fought drought and famine, but I was still undaunted.
I was the farmer at Concord who fired
the shot heard around the world.
I survived the bitter winter at Valley Forge.
I am the craftsman who made "Old Ironsides."
I am the workers who forged this Nation
with blood, sweat, and tears.
I have survived many wars, depressions, and diseases.

"Was it worth all the suffering?" I am asked.
Out of all my pain and trouble I have created a great Nation.
I am responsible for every American's having
an equal voice in our democratic government.
I have in my life created freedom of speech,
religion, press, and commerce.
The opportunities of education, occupations, and
improvements in living standards are all a part of me.

I am vast and aging, but not dying.
I shall continue to thrive as long as there
are craftsmen who have pride in their work.
In the youth of today lies my hope for tomorrow.

Nancy Jenson

CETA Map

New Haven, Conn.

When most people think of grants from the Federal Government they think big, at least six figures and usually more. But small amounts of money are at work, too. Maishe Dickman is an industrial designer and teacher of ceramic sculpture and pottery with the New Haven Arts Council, which is funded in part by CETA title III money. He proposed a vegetable garden in a vacant lot in New Haven's inner city to help the neighborhood's esthetic appreciation of its environment.

Dickman went to the Connecticut Agricultural Experiment Station here for advice on how to enrich the sandy soil under the urban rubble that littered the lot. The station conducted an experiment to determine the best soil treatment and concluded leaf compost would be best. Next spring the 60 families in the project will each be ready to treat their 20- x 20-foot plots with the compost and to plant vegetables again. The Federal Government's outlay was about $800 this year.

Salt Lake City, Utah

It's back to school for 45 Spanish-speaking heads of households to start learning English as a second language. A 25-week learning program, supported with $122,000 in CETA title III funds, started October 1 in Salt Lake City, Ogden, and Provo. Participants, either unemployed, underemployed or otherwise disadvantaged, will learn conversational or survival English, world of work English, and English related to specific occupational areas. The Utah State Board of Education is sponsoring the program.

Trenton, N.J.

The New Jersey Department of Education received a $250,000 CETA contract under title III to conduct a joint venture with the National Guard to provide 34 weeks of on-the-job training to high school juniors and seniors. The Division of Vocational Education and the Guard will train students as aircraft mechanics, machinists, electrical repairers, diesel mechanics, and 23 other occupations. The 1-year contract, effective last September 1, will provide preparation for entry-level employment for 150 students.

Weyers Cave, Va.

In this Augusta County Village, nestled in the foothills of the Blue Ridge Mountains, the value of a little pump priming is well known. So, it came as no surprise when $10,000 of CETA money was quickly augmented by $16,500 raised locally and, as a result, Augusta County children were the benefactors. The old North River Elementary School near Mt. Solon was in bad shape. But some local people served on the Central Shenandoah Manpower Council, which gets its title VI CETA funds through the Governor's Manpower Planning Council and the Virginia Employment Commission.

With Federal funds in hand, the Parent-Teachers Association (PTA) and the school board more than matched the money, and two local carpenters who had been out of work were hired for a year to convert a storeroom into a band room. With the band in its new space, the kindergarten realized a 50 percent space increase, too. Dr. David R. Eyler, dean of student services at Blue Ridge Community College and a member of the manpower council said, "It's amazing what just a little Federal money will do. The community responded. The school board came up with $12,000 and the PTA raised the rest. Others donated building materials."

Cleveland, Ohio

Business and labor had a meeting of minds here. In a joint effort called the Vocational Exploration Program (VEP), the National Alliance of Businessmen and the Human Resources Development Institute of the AFL-CIO administered a program in which 30 CETA-eligible young people received exposure to various occupations in Cleveland-area private industries and nonprofit organizations. Work was observed in the paralegal, fiscal, production, accounting, credit, and inventory control fields. Cleveland VEP, supported by $19,865 in CETA title III funds, was part of a $225,000 national pilot program funded by the Department of Labor.

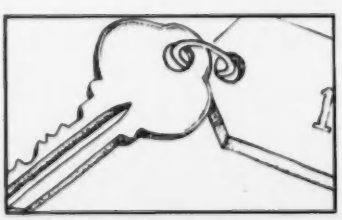
The young men and women were drawn from minority as well as nonminority backgrounds and were in the 16- to 21-year-old age bracket. The three VEP contracts in Cleveland called for 60 cents per hour for the contractor and $2.30 per hour for each participant, up to 225 hours over 9 weeks.

Atlanta, Ga.

A combination of boom, bust, and CETA in this southern metropolis generated an innovative program for training hotel and restaurant employees.

Paradoxically, Atlanta has experienced a phenomenal growth in the hotel and restaurant business at a time when the number of jobless Atlantans topped 30,000. The hotel-restaurant boom, coupled with the high rate of unemployment, led to formation of the Atlanta Hospitality and Training Program—a project to train waiters, waitresses, cashiers, office workers, night auditors, and food preparers.

The program, funded by the City of Atlanta for $50,000 under CETA title I, is operated by the Hospitality Council of Atlanta. Enrollees receive 7 weeks of training in preparation for job placement. To date, 123 out of 150 have landed jobs.



Wedded Women Who Work

by Laura Perlman

A house instead of a rundown apartment? Better schooling and new clothes for the kids? More nutritious meals? Perhaps a vacation, a car? For a sizable share of American families, having such advantages or doing without them may well depend on whether the wife works.

The substantial contribution of working wives to family income is documented in the latest report on a 10-year study of American women being conducted by the Center for Human Resource Research of The Ohio State University. The report, *Dual Careers, Volume 4,* shows that the earnings of black wives are particularly crucial to their families' level of living.

On the average, black working wives contributed 35 percent of family income in 1971, compared with 26 percent for white wives. With one notable exception, wives of both races contributed about the same proportion of family intake at all income levels. Among the poorest white families, however, the wife's earnings averaged almost half of total income.

But though their contributions to family income are proportionately greater, black wives suffer lower wages and less job satisfaction than their white counterparts, and fewer have moved into better-paying "men's" jobs. Such discrepancies—as well as general trends in women's labor force participation, occupations, earnings, child-care arrangements, and willingness to change jobs or move—are among the topics covered in *Dual Careers.*

This report is based on a longitudinal survey of more than 5,000 women who were 30 to 44 years old when the study began in 1967. Devised by the Bureau of the Census, the sample represents the Nation's 18 million women in this age group. The Center for Human Resource Research has conducted interviews with the sample population at 1- to 2-year intervals since 1967 to trace developments in their worklives. Volume 4 of *Dual Careers* reports on changes through 1972.

The years up to the study's halfway point were marked by changing attitudes about the role of women and continued efforts to eliminate discrimination based on race, sex, and age. How have these factors—along with the normal 5 years' aging—affected the women? By and large, the study reports general improvement. As their children grew older, more women went to work, and many working part time in 1967 took full-time jobs. Their wages were up, and well over half thought they had moved ahead on the job.

In a number of areas, the study identifies separate trends for black and white women, and some changes narrowed racial differences. Among the women surveyed, for example, black earnings are approaching the white level. While real average hourly earnings of white women rose 9 percent to $2.97 between 1967 and 1972, those of black women climbed 26 percent to $2.70, or from 79 to 91 percent of white earnings. Apparently, black women's greater work experience helps to account for their gains. When comparisons were confined to regularly employed women, blacks still gained relative to whites, but the improvement was less than for all working women.

Other changes that are wiping out racial differences include separate trends in the share of black and white women who work. While the white labor force participation rate increased 9 points to 56 percent, the black rate dropped 4 points to 63 percent, narrowing the differential from 20 to about 7 points.

Where the two races part company is in reactions to labor market conditions. Between 1969 and 1971, a period of declining economic activity, the proportion of black women entering the labor force dropped 6 points, while the share of white women rose 4 points. The clear implication is that decreases in job opportunities are more likely to discourage blacks than whites.

Numerous other findings point up the continued disadvantages of black women. For example, substantially more blacks than whites have health problems severe enough to affect the amount or kind of work they can do, and the disparity increases as the women grow older. While the proportion with work-limiting conditions was no greater among the whites in 1972 than 5 years earlier, it increased from under a fifth to over a quarter among the blacks.

Black women, who started work at lower occupational levels than whites, have also achieved less upward mobility than their counterparts. From their first jobs, blacks had moved up less than whites by 1967, and in the next 5 years, their relative occupational position continued to deteriorate. The study calls this finding "an additional reminder that the rather impressive effort in recent years in combating racial discrimination in the labor market still leaves something to be desired."

Changing jobs is one way a worker moves ahead, but again, race—as well as age—affects a women's opportunities. The study considered the women's willingness to change jobs, the actual changes, and the resulting payoffs. Overall, 6 out of 10 employed women in their thirties and forties expressed willingness to change employers for higher wages, but only about one-eighth actually made voluntary changes between 1969 and 1971.

Unlike middle-aged men, who are the subject of another Ohio State study, the older women were as willing to change as the younger ones, and more blacks than whites were inclined to do so. But actual job changes are another story. Eighteen percent of the women in their late thirties changed jobs, compared with only 10 percent of those in their late forties. The rate of change was nearly 4 percent lower for blacks than whites.

Overall, the payoff to the mainly younger, mainly white women who did voluntarily change was an earnings gain of about 6 percent over what they would probably have received by

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staying with the same employer. But the gainers were exclusively part-time workers; among women working full time, earnings increases were virtually identical for the changers and the women who stayed.

The modest gains resulting from their job shifts lead to questions about the kinds of changes women are making. Numerous studies have found that workers in "male intensive" industries earn more than those in "female intensive" ones, and, within given industries, "male" jobs pay more than "female" ones. Hence, it would seem, women could gain greatly by going into "men's" jobs. To test that proposition, the Ohio State researchers compared earnings of women employed in "men's" and "women's" jobs of comparable skill levels. They found that traditional women's occupations at the highest skill levels pay as well as other jobs with similar skills requirements, but that "women's" jobs requiring only moderate or low skills pay less than "men's" work of the same level.

This finding implies that women in low-skilled traditional fields can indeed profit by going into "men's" jobs at the same skill level. Happily for women in their thirties and forties, such moves are practical as well as profitable. It's relatively easy, for example, for a waitress to become a drill press operator but difficult for a registered nurse to become a pharmacist. Acquiring an entirely new set of complicated skills requires a high degree of motivation and an investment of time and money that few mature workers are prepared to make. The women most apt to make this commitment are young people planning their careers. Women in their teens and early twenties, the subject of another Ohio State survey, do tend to have high occupational aspirations, often for jobs in fields now dominated by men. The researchers suggest that "these aspirations may be part of a profound social change in American society."

Meanwhile, *Volume 3* of *Dual Careers,* published a year before the fourth volume, revealed only a modest increase in the proportion of older women holding atypical "men's" jobs. Between 1967 and 1971, the proportion of women in such jobs rose only around 1½ percent. But this figure masks considerable variation by race and educational level. Among whites, the proportion in atypical occupations climbed 4 points to 23 percent, while the share of blacks declined 3 points to 15 percent. While few blacks at any educational level entered atypical jobs, the proportion of whites with 11 or fewer years of school in such jobs increased about 8 points to 34 percent. In contrast, better educated women increased their share by a modest 2 or 3 percent.

The variation by educational level can be readily explained: Women with more education tend to have specialized training that locks them into a particular occupation. The reason for the racial disparity is less obvious. The explanation, like that for other job-related differences, apparently lies in racial discrimination. During their earlier working years, black women had been barred from many typically female jobs, and their atypical jobs in 1967 were generally less desirable than those held by white women with comparable schooling (for example, farm laborer vs. operative among those with less than a high school education). Presumably, women with such labor market experiences would be apt to equate "men's" jobs with disagreeable work and to consider more attractive the typical positions newly opened to blacks.

Yet whatever may be said about the justice of opening up opportunities for black women in traditional fields and their understandable response, the results were definitely to their disadvantage. By 1971, those who had moved into typical female occupations earned only 81 percent as much as all white women—a decline of 8 points from 1967.

The findings for both races clearly confirm that women earn more in "men's" jobs. For example, white women in atypical jobs in 1967 and 1971 earned an average of $3.45 per hour by the end of the period—51 cents more than those in typical jobs for both years; for blacks the comparable figure was $2.75—12 cents an hour higher than typical jobholders both years and 36 cents above those who moved into typical jobs. Leading in black gains were women who made the opposite move—from typical to atypical jobs—and thereby gained a shade under a dollar an hour in pay.

Does moving into traditional male fields lead to greater satisfaction as well as higher pay? The answer, the study indicates, depends on a woman's educational level—and hence, presumably, on the type of atypical work she was likely to be doing. By and large, white women with a high school education—but not those with less schooling—were more satisfied with their atypical jobs than with their earlier traditional ones. (No comparable findings were made for blacks because of the small numbers in these categories; for blacks at all educational levels taken together, though, job satisfaction declined among women in both traditional and atypical fields.)

While the major theme of *Dual Careers* is women's uneven progress in such areas as gaining higher wages and more satisfying jobs, its title reflects the fact that most women are wives and mothers as well as market workers. Obviously, a large share of male workers are also husbands and fathers; and as more women go to work, increasing numbers are sharing domestic duties. Yet for the near future at least, women are likely to continue to bear the major responsibility for home and children. Of the topics an-

alyzed in the report, a few are issues peculiar to that role—the availability of day care, the likelihood of combining a career with marriage and children, the effects of family moves.

Child care is commonly equated with community day-care centers; yet few women leave their children at such facilities. Among the survey group, only about 1 out of 10 working women with children under 6 used either public or private centers in 1971. The share was 9 percent for whites and 12 percent for blacks. The most common arrangement was family care, used by 46 percent of the white women and 56 percent of the blacks. Others left children at a neighbor's home, employed a private household worker, or used a combination of family and other care.

Volume 3 of *Dual Careers* suggests that day-care centers serve such a small fraction of working mothers' children for two reasons: lack of centers and mothers' preference for family care. The overwhelming majority of working mothers surveyed said they were content with their present arrangements, and those using family forms of care were the most satisfied. Yet substantial numbers reported that they would leave their preschool children at a center if one were available at no greater cost than their present arrangements. For every woman who left her child at a center, three said they would like to do so; the ratio of would-be to actual users was particularly high among blacks.

An issue of greater economic significance is the need for day care among mothers who do not work outside their homes. If those who work only intermittently are included, an overwhelming majority of women with preschool children are in this category. The proportions were 82 percent for whites and 63 percent for blacks over the 1967–71 survey period. Do most of these women stay home out of choice or because they have no place to leave their children? The answer, apparently, is different for blacks and whites. When asked if they would seek work if they could use a free day-care center, nearly half of the black mothers said they would do so immediately. Among white mothers, the share was only 13 percent.

While intentions are not always translated into action—and not all job searches lead to employment—these responses do suggest that many more black mothers would work if day-care facilities were expanded. And since black women generally make considerable contributions to family income, the earnings of these mothers could be expected to improve their families' economic well-being significantly.

Whether the reason is choice or lack of day care, most women still stay home with young children, according to *Dual Careers, Volume 4*. Hence the study finding that few mothers have careers is not unexpected. More surprising is the discovery that only 7 percent of ever-married women with children can be considered "career women." This figure seems especially low given the study's broad definition of a career woman as one with a relatively strong attachment to the labor market who has worked either in a single occupation or a group of related ones. In other words, the steadily employed household worker is as much a career woman as the highly educated professional. In contrast to the mothers, about half of all childless never-married women were found to have careers, as were about a third of ever-married women without children.

Like children, family moves often interrupt married women's worklives. Underlying the study's discussion of migration is the assumption that a family rationally evaluates possible moves with the aim of improving total income. Since the husband nearly always earns more than his wife, moves are generally designed to improve his earnings or occupational status. If the wife works, the family weighs the husband's expected gain against the probable loss resulting when the wife quits her job and looks for new employment elsewhere.

By and large, the experiences of the families studied were in keeping with this assumption. Families of working women were less apt to move than those solely dependent on the husband's earnings, and the likelihood decreased as the wife worked longer for the same employer. When such families did move, their total earnings went up, but only because the husband's increased pay more than offset the wife's loss.

Apparently, families so rarely migrate to advance the wife's career that this possibility was not considered. Yet recent publications have spotlighted families who have made such moves. True, the wives described may be atypical in attitudes and motivation, as well as in being highly educated professionals. But except for their sex, they are not atypical among people who move to better jobs; the study found that migrant husbands also tend to have above-average educations.

Are these moves anomalies or portents of change? No evidence of such a trend emerges from the study of women in their thirties and forties. But among younger ones, there are at least moderate breezes of change. Young women have higher occupational aspirations than their older counterparts, and when they marry, they are likely to have fewer children and to retain stronger career commitments. A woman with these values may be less ready to follow her husband to a better future (for him) than to sit down with him and work out the sort of living arrangements that will give each of them the best possible chance for a satisfying career. When that time comes—if it does—"dual careers" may have an entirely different meaning. □

Volumes 3 and 4 of *Dual Careers*, R&D Monograph No. 21, are available from the U.S. Department of Labor, Employment and Training Administration, Room 10225, 601 D Street, NW., Washington, D.C. 20213. Single copies are free as long as supplies last.

The Ayes of Texas Are on Eagle Pass

by Susan Jacobson

"This CETA project is *the* hope for Eagle Pass," Mayor Eddie Rodrigues says about the community effort which reversed a momentum that threatened to destroy the Texas town's 5 square miles.

Eagle Pass, a Mexican border community of 20,000 people, had just about succumbed to the deterioration caused by its Main Arroyo, a 5-mile-long, debris-filled, mosquito-ridden ravine which runs through its center. Nearly all of Eagle Pass' water drains into the arroyo (or one of its three small tributaries), which then empties into the Rio Grande River.

An arroyo is a natural, most often dry ravine with embankments of soil and natural growth. During high-intensity rains, the gully collects excess water and carries it to a main body of water, thus performing an essential service, particularly in the Southwest, where such rains are common.

However, the Eagle Pass arroyo's natural characteristics and obstructions such as rocks, trees, weeds, and irregularly shaped banks seriously impeded the water flow, causing frequent flooding. When the rains subsided, the stagnant ravine attracted rodents, mosquitoes, and debris. Owners of adjacent property found it futile to try to maintain their land, which the ravine was steadily eroding. In general, the Main Arroyo functioned more as a health hazard, a receptacle for the city's trash, and an embarrassment than as the major flood-protector it was supposed to be.

"It's been a black mark on the city," says Mayor Rodrigues, an Eagle Pass native. He recalls that improvement of the arroyo had been a high-priority project since the 1950's, but it was never considered sufficiently important to justify diverting city funding from the water system or street paving projects. The most the city could do for the arroyo was to try to keep it clean

Once a mosquito-ridden, debris-filled ravine, Eagle Pass' Main Arroyo has been transformed into a beauty spot.

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Transformation of the gully was done by local rocklayers employed in an innovative CETA program.

with weedkilling teams composed of municipal workers.

Then, in June 1975, the tide was turned in favor of improving the arroyo with funds available under the Comprehensive Employment and Training Act (CETA). Under the direction of the new city manager, Jim T. Brown, a program was implemented under title VI of CETA to replace weedpullers with rocklayers. Although no one realized it at the time, this project was the beginning of an entirely new profile for Eagle Pass.

The city's initial rejuvenation effort was supported with approximately $36,608 in title VI funds. Five CETA workers and one city employee with experience in masonry and concrete work were given on-the-job training at $2.20 per hour and assigned the job of lining Main Arroyo to improve drainage and halt overflow and erosion. Almost immediately, the rock crew of six was expanded to 20 workers. City management offered the workers supportive services: transportation to and from the worksite, family counseling, future job recommendations, and introductions to potential employers in and around Eagle Pass. Thus, the project provided Eagle Pass with the beginnings of a disciplined labor force adept at some construction techniques.

The results, claims City Manager Brown, "were nothing short of miraculous." Although the work touched only a small segment of the entire channel, owners of property adjacent to the revitalized segments immediately began improving their land by tearing out old backyard sheds and outhouses.

"They were beginning to feel like human beings again," adds Mayor Rodrigues, "now that the trash and mosquitoes were being cleared out and that the arroyo embankment wasn't eroding their property."

More important than the changes in the arroyo and the adjacent property, however, was what was happening to the workers themselves. To understand this, explains Mayor Rodrigues, it is necessary to know the background of workers in this area of the country. Historically, Eagle Pass has been predominantly agrarian. As farming became increasingly mechanized, the demand for unskilled labor decreased and the majority of the Eagle Pass labor force, either poorly educated or semiliterate, joined the migrant stream. In recent years, the only life they knew was that of the migrant. As a result, the area's unemployment rate reached as high as 23 percent.

The CETA project broke the migrant cycle in Eagle Pass for the first time, at least for a small number of workers. According to City Manager Brown, the men developed a sense of responsibility and pride in their new occupations. "Steady work was a new concept to them," he said. Thus, for the first time, Eagle Pass had the beginnings of a disciplined labor force adept in some construction techniques.

Eagle Pass

The success of this pilot project created enthusiasm about using the CETA-trained crewmembers as leaders in a more comprehensive redevelopment effort. The idea received further encouragement when Tom Bowles, an Eagle Pass rancher and unopposed Democratic candidate for sheriff in last month's election, offered to donate 7,000 linear feet of fieldstone to improve the entire Main Arroyo.

As the town began to explore various possibilities, attention focused on San Antonio, 140 miles away, where recent community redevelopment efforts had transformed the San Antonio River into the city's most important economic asset and one of the leading attractions in the Southwest.

Eagle Pass retained a San Antonio firm associated with the San Antonio River project to study the Main Arroyo. The firm developed a preliminary plan proposing a renovation based on structural changes and beautification and eventual incorporation of commercial and recreational facilities along the perimeters. While work was being done to improve the city's drainage and eliminate some of the health hazards, the arroyo would be used as a catalyst to develop the entire area.

The plan's most significant feature was its emphasis on labor-intensive construction with minimal reliance on equipment and forms. To achieve a riverwalk effect, the planners decided to use hand-laid stone throughout the project, instead of pouring a concrete ditch and putting rock above it, as would have been done if construction machinery had been used.

Thus equipped with a plan designed to make maximum use of the skills of the CETA rock crews, the city applied to the Economic Development Administration (EDA) for title X Public Works Project funds to purchase materials and equipment. The grant application for the first phase of the project was filed on September 3, 1975, through the Middle Rio Grande Development Council in Del Rio, Tex. On December 16, 1975, $591,200 was approved for 1 year of operation. The city added $147,819, bringing the total of $739,013. The EDA required that 75 percent of the grant go to labor and 25 percent to materials and rental of equipment.

Texas fieldstone was cut to specification and laid by hand throughout the project. A rocklayer developed a sense of pride in the work.

Before recruiting workers, the city trained the 20 CETA rock crewmembers to be supervisors and crew leaders. Initially, on-the-job training was conducted at the arroyo, but it was soon discovered that something more was needed. Most of the men were unable to relate to the formal, more technical specifications and many had difficulty understanding a set of plans. To help them relate to the plan's expected accomplishments, the workers were taken to Austin to see a project sponsored by the Austin Urban Renewal Agency and to San Antonio to see the river project. There they could feel the rock and mortar and actually see the anticipated results. "After the trip, our rate of progress doubled," says City Manager Brown.

Photos by Franco Cernero

Against a background of arroyo improvements, Mayor Rodrigues (left) and City Manager Brown discussed Eagle Pass' new profile, which is expected to be a source of economic renewal.

Once the CETA men were fully trained, notices for additional workers were published in English and Spanish. Applicants had to be either unemployed veterans or workers who had been unemployed for a minimum of 15 weeks before the grant application; they were required to be Maverick County residents and to show proof of United States citizenship or legal resident status. Raul Hernandez, coordinator for Valverde County Manpower Programs, screened the applicants for eligibility and made referrals through the Texas Employment Commission. The city staff completed the final screening and hiring procedures for 119 jobs. All of the new workers were trained by the CETA crew; those most qualified were trained as crew leaders, supervisors, and administrators. Of the total work force, 7 percent are in clerical positions, 38 percent are skilled, and 55 percent unskilled. Whatever the position, the mayor emphasizes, "We hired only one person per family; and we began with the largest family with the lowest income. Every person involved in this project was employed before the project began—from the official timekeeper to the chief of hiring."

The project's first phase encompasses 2,000 feet—over 30 percent of the 7,000-foot project. The remaining 5,000 feet will consist primarily of drainage improvements, a far more complex phase. It calls for the creation of three dams, an amphitheater, channel improvements, and landscaping. It is hoped that this section will eventually incorporate commercial and recreational facilities, attracting local investors, out-of-town investors (including Mexicans), and tourists.

Eagle Pass is already beginning to attract visitors. Because its renovation program is the largest ever undertaken in the area—and its design promises a unique blending of problem-solving, beautification, and function—representatives of nearby cities have come to explore similar possibilities for their own communities.

The casual observer finds it difficult to imagine that the hard-working Main Arroyo crew once required formal training. Indeed, these workers, who are 99.9 percent Spanish-speaking and whose ages span a period of more than 40 years, appear more veteran than novice, more craftworker than construction worker, as they carefully carve native fieldstone to specification, check and recheck measurements, and aline each new addition to the rock-lined channel. The resulting pride resembles that of an artisan admiring a piece of hand-carved sculpture.

Less visible, but no less important, is the respect for steady employment that has been transmitted from the original CETA workers to the present crew of nearly 100. For example, Zacarias Chavarria, 24, had been going North every year since 1967. "When I'd come back to Eagle Pass," he says, "I couldn't find work. This year I decided not to go North at all. I thought it would be better to stay on the arroyo job where work would be more permanent." Previously unskilled, Chavarria leads a rock-laying crew of 10.

Administrative as well as construction skills have emerged from the project. Personnel manager Rudy Natal, a Vietnam veteran, supervises 90 to 100 employees. "That should help me get work after this project is completed," he says.

Just when that will be is uncertain. Completion of the current phase was expected in February 1977, but because of the delay in on-the-job training and an unprecedented amount of rain, the deadline will not be met. An application for additional funding is being prepared.

However, job opportunities provided by the project are expected to exceed the duration of funding. The surge of civic pride generated by the venture is expected to attract additional public and private improvements. The long-range design plan offers unlimited possibilities—hotels, restaurants, and shops. When the activity begins, Eagle Pass will have the nucleus of a local skilled construction force to accommodate the demand. □

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21ST CENTURY WORKER?

The year 2001 may begin an era of mass pioneering in space and, if so, a number of American wage-earners will look like astronauts as they go – self-propelled – off to work. Such a possibility and other futuristic predictions are dealt with in **Work in 2001**, an article on page 21, which concludes WORKLIFE's Bicentennial series.